

**Technical training.**  
**Product information.**

## **E84 Complete Vehicle**



**BMW Service**

Edited for the U.S. market by:  
**BMW Group University**  
**Technical Training**

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# General information

## Symbols used

In this document, the following symbol/representation is used to provide a better understanding or to highlight especially important information:



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Contains important safety instructions and information that are required for proper system function and must absolutely be followed.

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## Current applicability and country-specific models

Vehicles manufactured by the BMW Group satisfy the highest safety and quality requirements. Changing requirements with respect to the protection of the environment, customer needs, design or engineering result in a continuous enhancement of systems or components. As a result, the contents of this document may differ from what is in the vehicles available for training.

This document in principle relates to left-hand drive vehicles in the European version. In vehicles equipped with right-hand drive, some operating controls and components are located at positions other than those depicted in the illustrations in this document. There may also be additional differences associated with market- or country-specific equipment packages.

## Additional information sources

You can find additional information about the individual topics:

- In the Owner's Manual
- In the Integrated Service Technical Application.

Contact: [conceptinfo@bmw.de](mailto:conceptinfo@bmw.de)

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# E84 Complete Vehicle

## 1. Introduction

### 1.1. General information

The new BMW X1 launched in August 2012 was the first Sports Activity Vehicle SAV in the premium compact class. The BMW X1 follows the extremely successful tradition of the models BMW X5, BMW X3, and BMW X6. Their features and characteristics are available for the first time in a smaller vehicle class.

The typical features of a BMW X-model combined with gracefully elongated proportions represents the distinct character within the family of BMW X-models. The striking front view underlines the robust and powerful appearance of the BMW X1 by emphasizing the width.



BMW X1

#### 1.1.1. Model versions

The new BMW X1 was offered in the following models for the US market introduction:

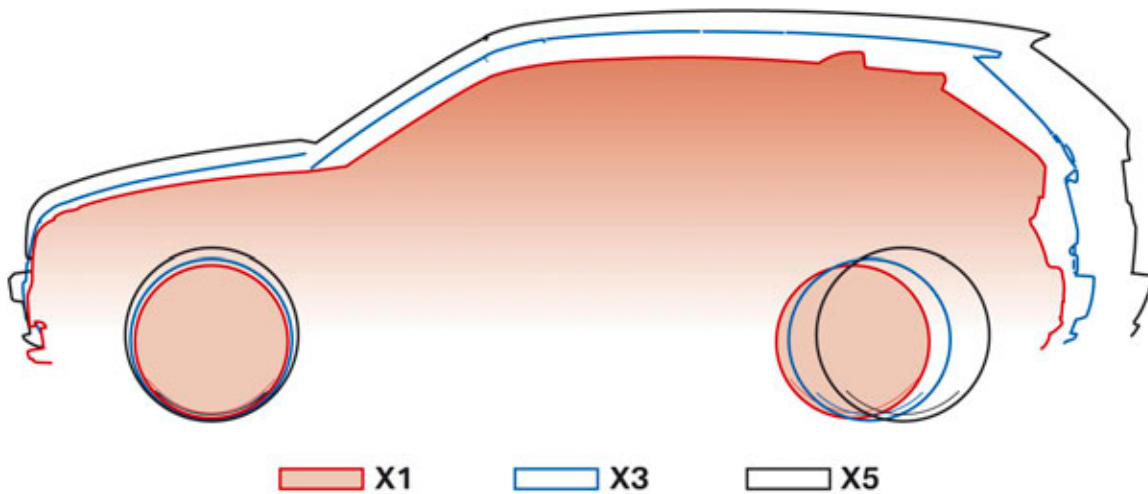
- BMW X1 xDrive35i with N55B3000 (300 HP 300 lb-ft)
- BMW X1 xDrive28i with N20B2000 (241 HP and 258 lb-ft)
- BMW X1 sDrive28i (rear wheel drive) with N20B2000 (241 HP and 258 lb-ft)

# E84 Complete Vehicle

## 1. Introduction

### 1.1.2. Silhouette comparison

In comparison to the two current models BMW X3 and BMW X5, an outer proportion geared towards the X was created for the BMW X1.



TG09-0184

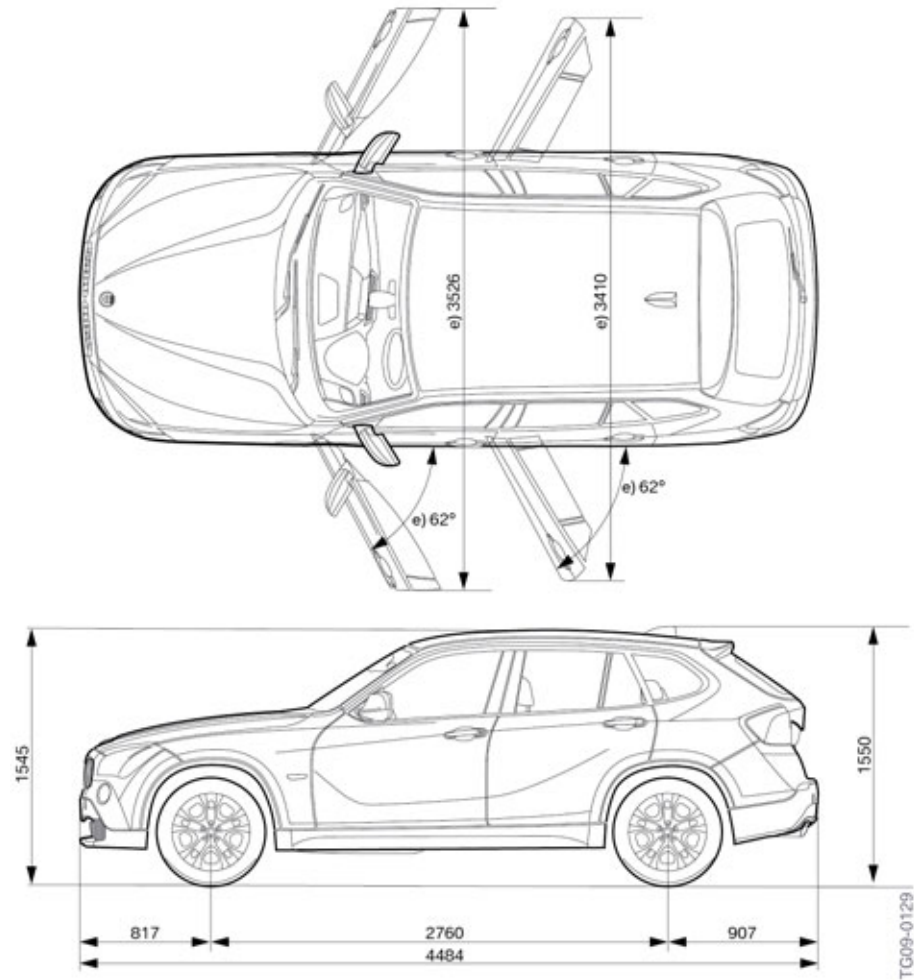
Silhouette comparison to BMW X3 and BMW X5

The increased head clearance as well as the additional space provided in the BMW X1 due to the raised seat position between sedans and X-vehicles (semi command feel) are clearly visible on the inside as well.

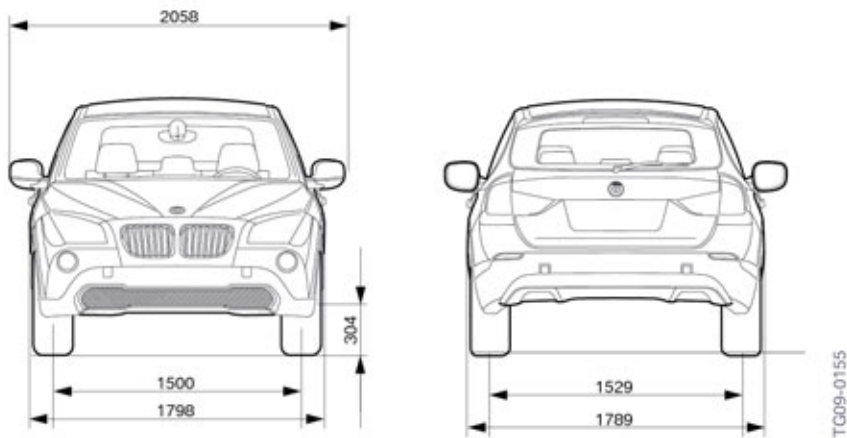
# E84 Complete Vehicle

## 2. Body

### 2.1. Dimensions



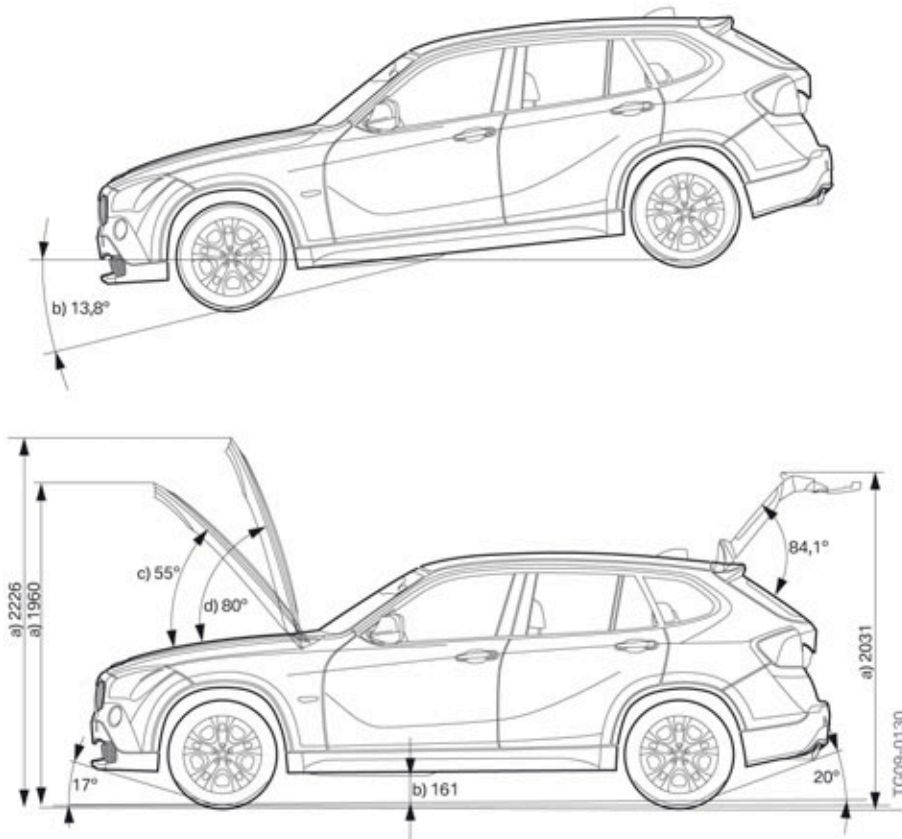
Dimensions



Dimensions

# E84 Complete Vehicle

## 2. Body



Dimensions

	<b>BMW X1/E84</b>	<b>BMW X3/E83</b>	<b>BMW 3 Series Sport Wagon E91</b>
Length	4484mm	4565 mm	4520 mm
Width	1798 mm	1853 mm	1817 mm
Height	1545 mm	1674 mm	1417 mm
Wheelbase	2760 mm	2793 mm	2760 mm
Front overhang	817 mm	816 mm	755 mm
Rear overhang	907 mm	954 mm	1005 mm
Front track width	1500 mm	1524 mm	1500 mm
Rear track width	1529 mm	1549 mm	1528 mm

The raised seat position of the BMW X1 compared to E9x vehicles is +88 mm.



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## 2. Body

### 2.1.1. Technical data

The most important BMW X1 data is compiled in the following tables.

Engine data	Unit	sDrive28i	xDrive28i	xDrive35i
Displacement	cm <sup>3</sup>	1997	1997	2979
Number of cylinders		in line 4	in line 4	in line 6
Power	kW/HP	241	241	300
At RPM	RPM	5000-6500	5000-6500	5800
Torque	Nm/lb-ft	350/258	350/258	300
At RPM	RPM	1250-4800	1250-4800	1300-5000
Compression ratio	$\epsilon$	10:1	10:1	10.2:1
Stroke	mm	90.1	90.1	89.6
Bore	mm	84	84	84
Acceleration 0 to 60 mph	s	6.2	6.3	5.3

Weights	Unit	xDrive28i	xDrive35i	
Vehicle curb weight without driver	kg/lbs	1600 / 3527	1690 / 3726	1765 / 3891
Weight distribution (empty car)	%	50.6	49.4	47.9
Permissible gross vehicle weight	kg/lbs	2040 / 4497	2135 / 4707	2205 / 4861
Towing capacity	kg/lbs	TBD*	TBD*	TBD*

TBD\* - To Be Determined (not available at this time)

For additional technical data on the BMW X1, refer to the Owner's Manual for the BMW X1 vehicle.

## 2.2. Bodyshell

The bodyshell of the BMW X1 is based on the BMW 3 Series Sport Wagon xDrive chassis. Like the body of the BMW 3 Series Sport Wagon, the body of the new BMW X1 is made from different kinds of steel and is fully galvanized.

# E84 Complete Vehicle

## 2. Body

The following materials are used:



TG09-1116

Bodyshell of BMW X1

Index	Explanation
<b>Steels</b>	
1	DC04, DX54D,
2	DX56D, HC 180BD, HC 180YD, HX180BD
3	HC 220BD, HC 220YD, HX 220BD, HX 220YD
4	HC 260BD, HC 260LAD, HC 260YD
5	HC 300BD, HC 300LAD, HC 300XD, HX 300BD, HC 340LAD, HC 340X
6	HC 380LAD, HC 400T(D)
7	HC 420 420LA(D)
8	HD 680C(D)
9	HC 1000W(D)

# E84 Complete Vehicle

## 2. Body

Index	Explanation
<b>Plastic</b>	
10	Plastic
<b>Miscellaneous</b>	
11	Other metallic materials

### 2.2.1. Crash behavior

The BMW X1 features a stable passenger compartment that provides the occupants with the highest possible level of safety in the event of a collision. This good crash behavior is achieved in particular by using maximum strength steels in the pillar and node structures.

In the event of head-on collisions, side member structures that fold in a specific manner ensure that the crash energy is dissipated as evenly as possible. In the event of a head-on collision with minimal overlap, specially designed cross member structures ensure that the acting forces are also transferred to the side of the vehicle opposite the impact.

Part of designing these structural features was to optimally coordinate the restraint system with the vehicle. In addition to front airbags for the driver and front passenger, the BMW X1 is equipped with a deformable steering column and belt tensioners with force limiters.

There is only a very short crumple zone for side collisions. To achieve a low occupant load, particular attention must be paid to the lowest possible penetration depth. A major contribution to this is made by the B-pillar designed from maximum strength sheet metal in combination with the doors that feature impact members which effectively reduce penetration of the doors into the interior. The side structure is achieved by optimally distributing the acting forces to the various load paths such as the A-pillar or the instrument panel cross member.

The rear deformation area is formed by two support profiles running longitudinally, the luggage compartment floor, the rear trim panel, the rear side panels integrated into the side frame and various reinforcements.

## 2.3. Exterior

### 2.3.1. Front/rear system

The front end meets the high requirements for pedestrian protection by providing corresponding deformation spaces under the engine compartment lid as well as yielding hinge kinematics.

The rear bumper comes standard with attachment points for two towing lugs or the fixture for a bicycle carrier available as an accessory.

The difference between the front and rear bumpers as well as the sill trim in the basic version and the X-line package is the painted individual parts. The individual part in the rear bumper is larger than in the basic version, and two painted individual parts are added in the sill trim. The individual parts used in the bumpers of the basic version are not painted but are made from silver-color material.

# E84 Complete Vehicle

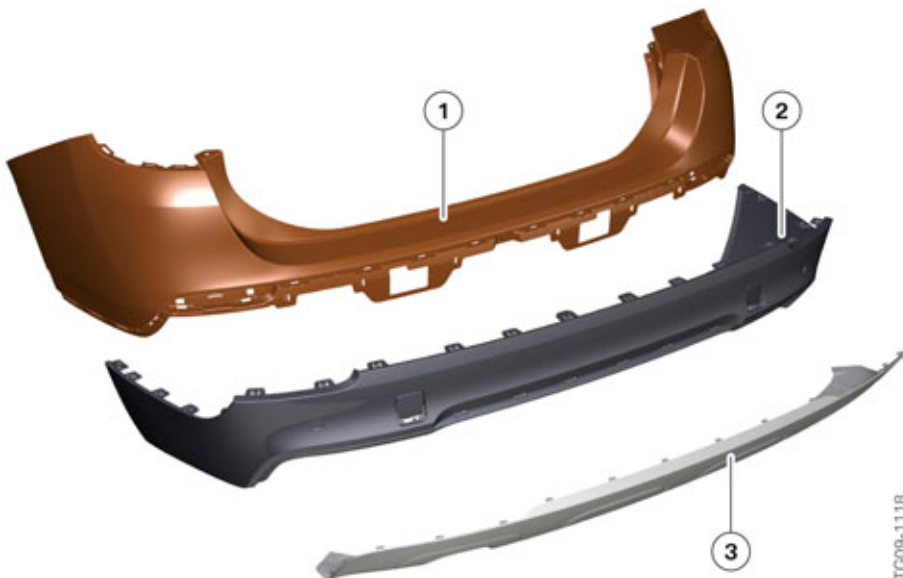
## 2. Body



TC09-1117

Front bumper

Index	Explanation
1	Front end
2	Upper bumper trim
3	Lower bumper trim



TC09-1118

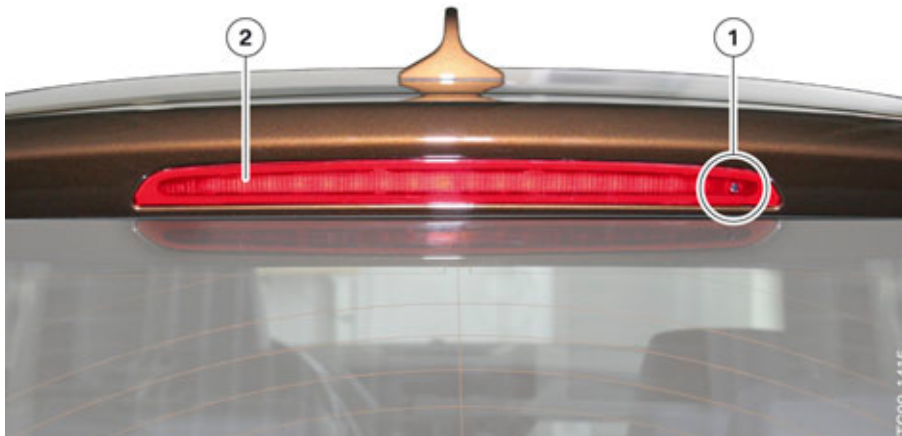
Rear bumper

# E84 Complete Vehicle

## 2. Body

Index	Explanation
1	Upper bumper trim
2	Lower bumper trim
3	Bumper cover

The additional third brake light is accommodated in the rear spoiler. The washer jet is not integrated in the wiper as in the BMW 1 Series, but in the brake light, so that water is sprayed on the window from top to bottom. This results in an optimized cleaning function.



3. Brake light in rear spoiler

Index	Explanation
1	Washer jet for rear window
2	Brake light

The innovative design of the heated rear window and the integration of an FM and AM antenna function make it possible to completely eliminate a rod antenna or roof fin in the base.

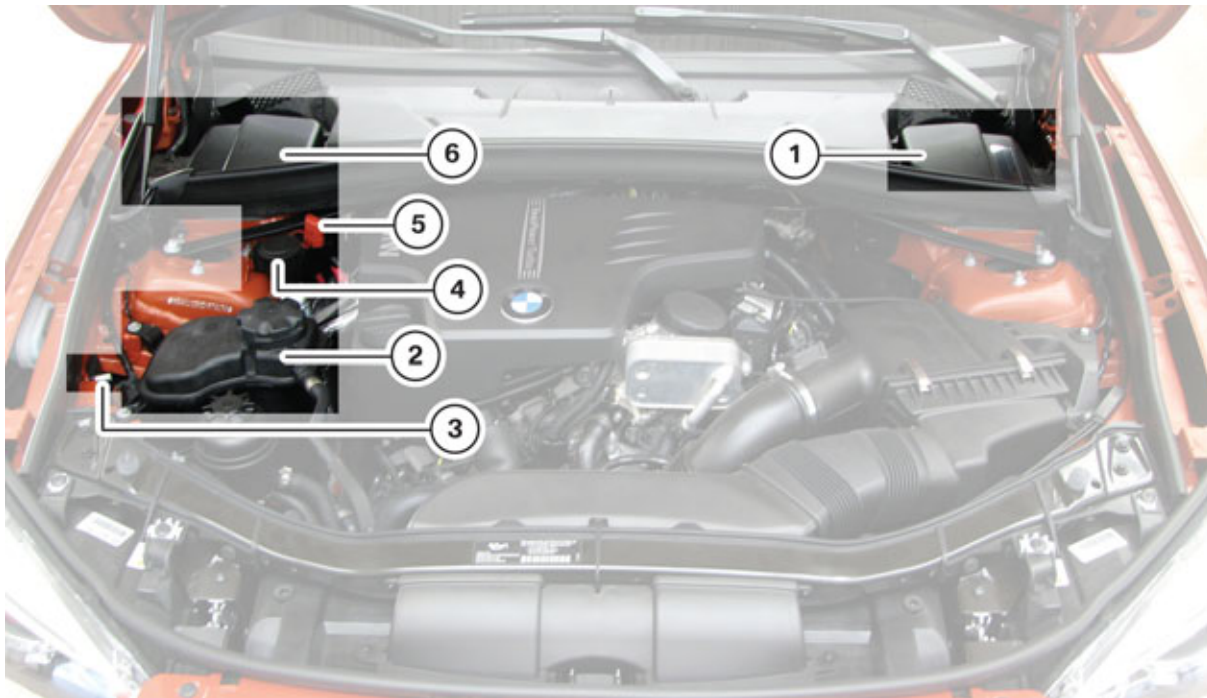
For a detailed description of the rear window, refer to the Entertainment “Rod-free antenna system WING” Section.

### 2.3.2. Engine compartment

BMW X1 xDrive28i with the N20B2000 was chosen as an example for illustrating the engine compartment.

# E84 Complete Vehicle

## 2. Body



Engine compartment of BMW X1 xDrive28i with N20B2000

Index	Explanation
1	Cover for brake fluid reservoir
2	Expansion tank for engine coolant
3	Grounding point
4	Reservoir for washer fluid of the headlight and windshield washer system
5	Positive battery connection point
6	Electronics box

### 2.3.3. Doors

The doors meet the more stringent side impact requirements in the USA. Additional side reinforcement, including in the front doors, prevents the doors from opening during impact. The rear doors are also equipped with an additional strut, which is already being used in other model series.

A “crash pad” in the door trim panel in the form of integrated ribs reduces the occupant load in the chest area by moving the pelvis up early on. These measures are important for the 5\* Euro NCAP rating.



# E84 Complete Vehicle

## 2. Body

### Door trim panel

The door trim panel has the following features:

- Storage offered in the door (cup holders)
- An integrated crash pad and a flexible attachment system have been incorporated into the trim panel
- The new design line in the interior is accented by the color and material separation between the top end moulding and the body of the door.
- The two-tone scheme from the cockpit continues throughout the entire interior towards the rear.



Door trim panels, left

TG09-1119

# E84 Complete Vehicle

## 2. Body

### 2.3.4. Exterior mirrors



Exterior mirrors incorporate LED turn signal repeater

The side turn signal repeaters use LEDs and are integrated in the exterior mirror.

### 2.3.5. Tailgate

The tailgate is made of steel and designed as a single piece. The rear window is glued and cannot be opened separately.

The tailgate can be opened by pressing the button located above the rear license plate.



# E84 Complete Vehicle

## 2. Body



BMW X1 tailgate

### 2.3.6. Exterior lights

#### Headlights

The BMW X1 offers the following headlight versions:

- Halogen headlight are standard equipment on the sDrive28i and xDrive28i.
- Bi-xenon headlights coupled with parking light rings are standard on xDrive35i and optional on sDrive28i and xDrive28i.

# E84 Complete Vehicle

## 2. Body

The fog lights are already integrated as standard in the bumper.



BMW X1 halogen headlight

Index	Explanation
1	High beam headlight
2	Low beam headlight
3	Turn indicator

Note: For the US market the eyebrows on the standard halogen headlights are chrome-plated instead of having frosted glass.

The design of the optional bi-xenon headlights has been modified. The side lights and the daytime driving lights are now supplied with power from LEDs. The LEDs can be operated in two power stages. If they are activated at full power, they are daytime driving lights. For side lights roughly 10 % of their power is dimmed.



BMW X1 bi-xenon headlight

Index	Explanation
1	Daytime driving lights/parking light rings
2	Low beam headlight/high beam headlight/cornering light
3	Turn indicator

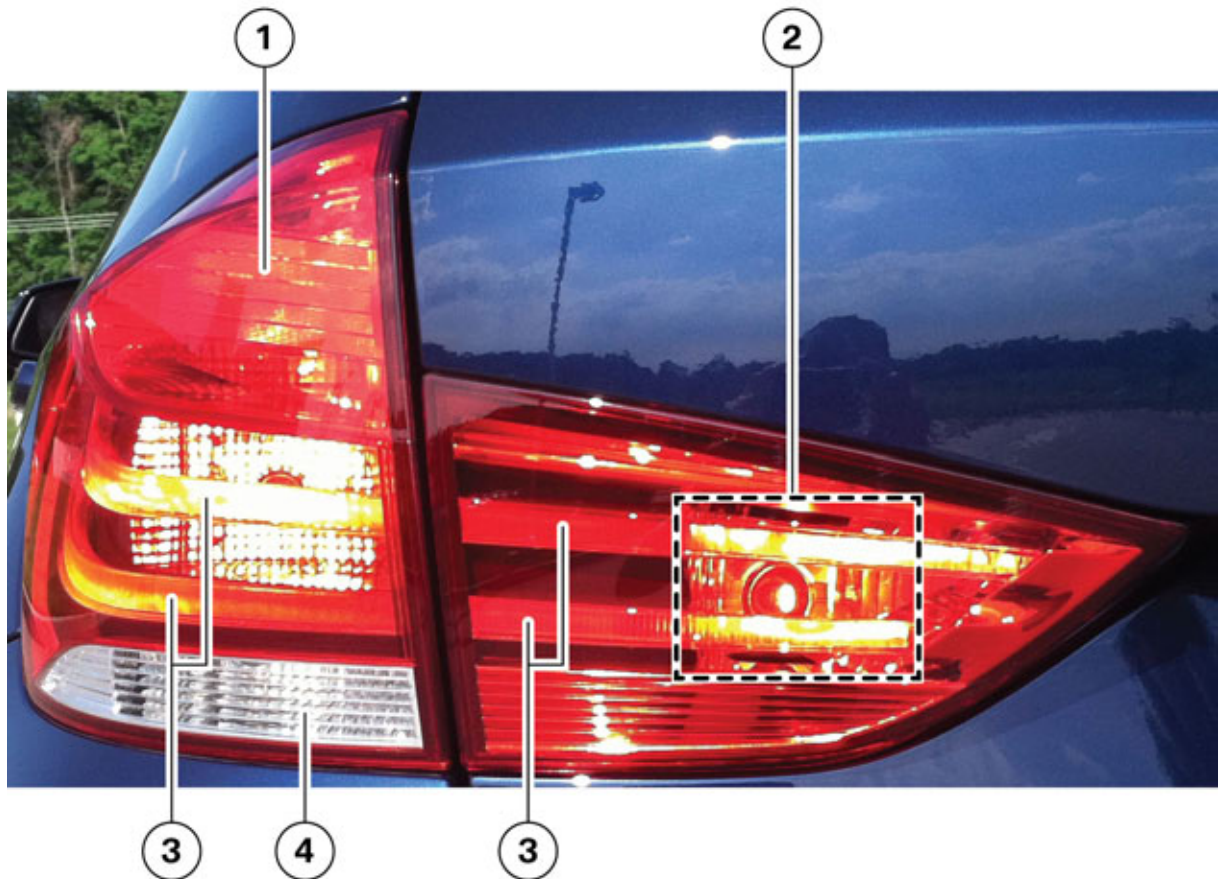
# E84 Complete Vehicle

## 2. Body

### Rear lights

The rear lights in the basic version of BMW X1 are equipped with bulbs.

The tail light function is achieved using two extra wide LED optical fibers each, which accentuate the L-shape of the rear lights across both light chambers.



BMW X1 rear lights

Index	Explanation
1	Turn indicator (bulb)
2	Brake force display (bulb)
3	Tail light (LED tubes)
4	Reverse light (bulb)

# E84 Complete Vehicle

## 2. Body

The brake light function is realized with the use of 2 bulbs (which are located just behind the LED tubes)



Two brake light bulbs located just behind the tail light LED tubes.

The rear reflectors are integrated in the bumper as a separate unit.

### 2.4. Interior

#### 2.4.1. Front seats

The BMW X1 is offered with basic seats and sports seats. Both versions are also available with electrically adjustable functions. The side airbag is integrated in the front seats. What is new is that the standard seat height adjustment in the basic version also allows the front passenger to optimally adjust the seat position. Widening the head restraints underscores the X-character of the seats.

#### 2.4.2. Rear seats

The rear seat is designed for three people. The three-part, foldable rear seat backrest is separated at a ratio of 40:20:40. The right backrest part and the center backrest part can be folded down individually. The left backrest part is coupled with the center backrest part and cannot be folded separately.

All backrest parts can be adjusted in eleven stages at angles between 1° and 31°. This makes it possible to achieve a particularly comfortable seat position as well as provides a cargo position for the transport of larger objects.

The center backrest can be folded down separately thus creating a large through-loading opening while at the same time permitting the outer seats to be used.

# E84 Complete Vehicle

## 2. Body



Rear seat bench

Index	Explanation
1	40 %
2	20 %
3	40 %

### 2.4.3. Panorama glass roof

In comparison to a conventional slide/tilt sunroof, the panorama glass roof with its enlarged glass surface makes a positive contribution to the vehicle's interior appearance and sense of space. A two-section electrically movable sliding trim enlarges the glass portion. The electrically movable sliding trim and the resulting elimination of the handle recess have an additional positive effect on the appearance of the interior. The electrically movable sliding trim now appears as a homogenous area in the interior design.



# E84 Complete Vehicle

## 2. Body



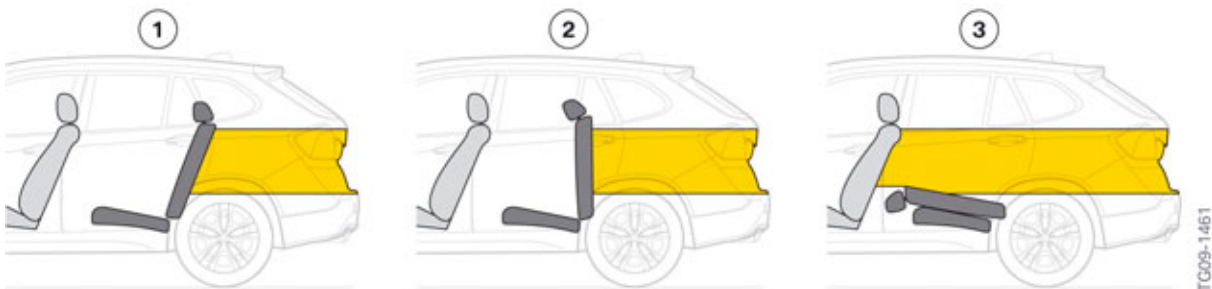
Panorama glass roof

The panorama glass roof is a slide/tilt sunroof system running on the inside with a fixed rear glass roof. The front glass roof and the sliding trim can be moved electrically and are controlled via a switch in the roof function center.

For further information on the panorama glass roof, refer to the Owner's Manual for the BMW X1 vehicle, as well as the product information for the BMW 3 Series Sport Wagon.

### 2.4.4. Luggage compartment

The luggage compartment volume is approx. 410 l in normal position (25°) and, depending on the position of the rear seat system, up to 480 l in the cargo position (1°).



Position of the rear seat system

# E84 Complete Vehicle

## 2. Body

Index	Explanation
1	Normal position (25°)
2	Cargo position
3	Luggage compartment floor position

The area for accommodating numerous recreational and everyday objects is expanded through a second loading level below the luggage compartment floor.

Additional information on the functional space concept is available in the Owner's Manual for the BMW X1 vehicle.

### 2.5. Safety systems

#### 2.5.1. Active safety

The following systems contribute to the active vehicle safety of the BMW X1:

- Dynamic cruise control
- High beam assistant
- Daytime driving lights
- Cornering light
- Brake force display

A detailed description of the listed systems is available in the Electrical Systems section and in the Owner's Manual for the BMW X1.

# E84 Complete Vehicle

## 2. Body

### 2.5.2. Passive safety

The following airbags are used in the BMW X1:

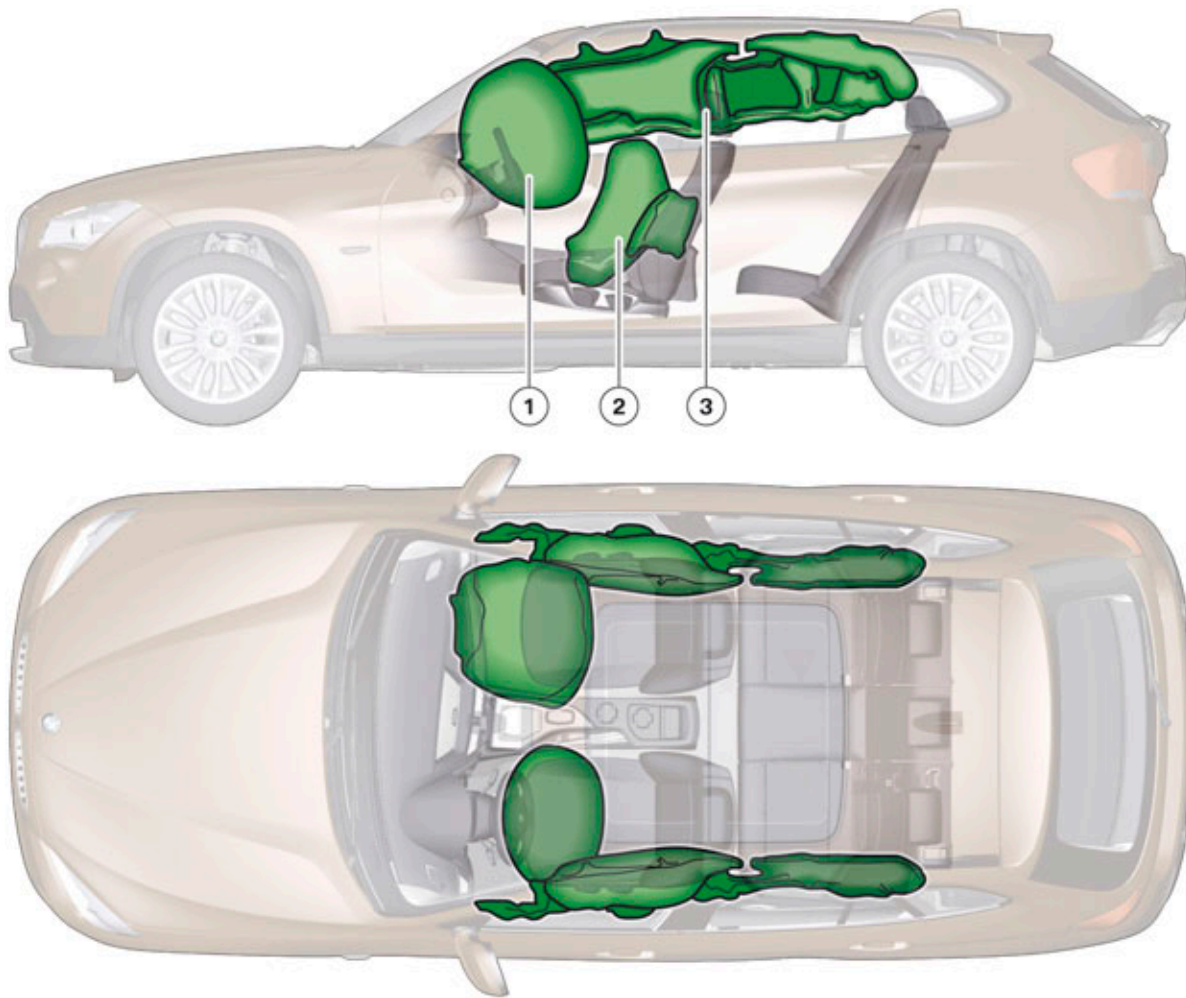


Illustration of the airbags in the BMW X1

Index	Explanation
1	Driver and front passenger airbag
2	Pelvis/thorax airbag
3	Head airbag for front and rear occupants



# E84 Complete Vehicle

## 3. Powertrain

### 3.1. Engine versions

With the special engine versions that are also being offered for the BMW X1, the BMW Group wants to ensure and expand its leading position with respect to dynamics at reduced consumption and improved operating efficiency.

For the market introduction, the following engine versions will be offered:

Model	Engine	Transmission
BMW X1 sDrive28i AT	N20B2000	GA8HP45Z
BMW X1 xDrive28i AT	N20B2000	GA8HP45Z
BMW X1 xDrive35i AT	N55B30M0	GA6HP19TU

#### 3.1.1. Engine N20

The engine has the following features in the BMW X1:

- N20 performance is comparable to the N52 six cylinder
- Less weight N20 = 324 lbs, N52 = 354 lbs
- Better fuel economy and lower emissions than N52
- TVDI (Turbo Valvetronic Direct Injection)
- 3rd generation Valvetronic with new intermediate levers
- Map controlled (pendulum-slide) oil pump
- TwinScroll exhaust turbocharger
- Positive crankshaft offset
- High-pressure injection (HDE) with solenoid valve injectors (as N55)

#### 3.1.2. Engine N55

The adaptations of the 6-cylinder gasoline engine to the installation space of the BMW X1 are relatively minor.

Here is a list of the major features:

- One exhaust manifold with catalytic converter near the engine, for cylinder groups 1-3 and 4-6 with stainless steel exhaust system
- TwinScroll exhaust turbocharger
- TVDI (Turbo Valvetronic Direct Injection)
- Map controlled (Duroplast-slide valve) oil pump
- High-pressure injection (HDE) with solenoid valve injectors

# E84 Complete Vehicle

## 3. Powertrain

### 3.2. Transfer case

The transfer case is described in Chassis Section.

### 3.3. Automatic transmission

#### 3.3.1. GA6HP19TU

The 6HP19TU automatic transmission is installed in the xDrive35i in combination with the N55 engine. The 6-speed automatic transmission 6HP19, clearly improved gearshift dynamics are achieved with this technical revision. In addition, a more stable regulation of the converter lockup clutch leads to improved shifting comfort, in particular at low temperatures. This contributes to consumption reduction.

**Note: Because the 6HP19TU automatic transmission is not designed to perform the MSA function the Auto Stop Start feature is not available on the xDrive35i.**

#### 3.3.2. GA8HP45Z

The GA8HP45Z is installed in both the sDrive28i and the xDrive28i in combination with the N20 engine. The transmission family GA8HP refers to the GA8HP45Z eight forward gears and one reverse gear. This transmission is built by ZF and its rated to 450 Nm of maximum torque

The GA8HP45Z is a new development which gradually superseded the established GA6HP19ZTU 6-speed automatic transmissions.

Highlights when compared to the GA6HP transmission:

- Significantly enhanced spontaneity of the gears shifts
- Greater driving and shifting comfort as a result of smaller gear jumps
- Higher control precision of the converter lock-up clutch at low engine loads
- High power transmission of the converter lock-up clutch
- Reduced fuel consumption (-5 to -6%)
- Equipped with a hydraulic pressure accumulator to perform the MSA function

**For more information regarding the GA8HP45Z automatic transmission refer to the ST1106 F25 Complete Vehicle training material available on ICP and TIS. And for additional information regarding the MSA function refer to the ST1113 F30 Complete Vehicle “Powertrain” training material available on TIS and ICP.**

#### 3.3.3. Automatic engine start-stop function

With the market introduction of the E84 the automatic engine start-stop function MSA is installed as standard, with the exception of the BMW X1 xDrive35i, as MSA is only available in all models with a 8-speed automatic gearbox (GA8HP).

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## 3. Powertrain

### Automatic transmission (GA8HP)

The automatic engine start-stop function switches off the engine when the vehicle is brought to a standstill, the selector lever remains in the D position, and the driver presses the brake pedal to hold the vehicle at a standstill. This means that the car does not use any fuel when it is at a standstill. When the driver releases the brake pedal again, the engine is automatically restarted and the driver can continue driving.

Alternatively, the driver can move the selector lever from the "D" to the "P" position and release the brake pedal. The engine remains switched off. The engine is automatically started as soon as the driver moves the selector lever to the D position.

The operating logic of the automatic engine start-stop function for vehicles with automatic transmission is known from the F30.

### 3.3.4. ECO PRO mode

ECO PRO mode is standard equipment in all BMW X1 models



E84 driver assistance system operating facility

Index	Explanation
1	ECO PRO button

The ECO PRO mode supports the driver in adopting a consumption-optimized driving style and reduces fuel consumption through intelligent control of energy and A/C management.

# E84 Complete Vehicle

## 3. Powertrain

Essentially the following measures help to reduce fuel consumption:

- The driver is supported in adopting an optimized-consumption driving style by means of an alteration of the accelerator pedal characteristic and the shift program in automatic transmissions.
- The heating and air-conditioning system (IHKA) is placed in ECO PRO mode. Here the A/C system operates at reduced air drying and cooling. If the required temperature can be achieved without cold production, the A/C compressor is switched off. During heating mode the engine operating mode with increased heat dissipation is to the greatest possible extent dispensed with and the electric auxiliary heater is operated at lower power.
- The driver is prompted by various displays to adopt an optimized-consumption driving style and is supported in optimizing their driving style.

Depending on the driving style consumption savings of up to 15 % or an average of 8 % can be achieved by these measures.

Upon activation of ECO PRO mode the automatic engine start-stop function MSA only used in the sDrive28i and xDrive28i is activated unless it has been manually deactivated beforehand.



E84 displays of ECO PRO mode in the CID

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## 3. Powertrain



E84 displays of ECO PRO mode in instrument cluster without CID

Index	Explanation
A	ECO PRO Active
B	ECO PRO Not Active in stand by mode (example: transmission sport/manual mode selected, heavy acceleration, etc.)

### 3.4. Final drive

The main goal during the development of the final drive for the BMW 1 Series and BMW 3 Series and now also for the BMW X1 was a considerable improvement in efficiency that will lead to a corresponding consumption reduction in the vehicle. This led to a new final drive generation called “L axle drive” (L = friction-optimized).

#### 3.4.1. Rear axle final drive

For the first time, double helical ball bearings are used in the rear axle final drives, thus significantly reducing the operating temperature, which has a positive effect on function and service life. At the same time, oil flow losses are reduced considerably. The gearing was also adapted to the modified displacement behavior as well as optimized with regard to efficiency.

In addition, the torque capacity of the rear axle final drives HAG168L and HAG188L was increased by 10%. For acoustic reasons, the housing of the rear axle final drive is still designed as a spheroidal cast part.

With regard to the improved consumption concept of the driving performance dynamics, a specifically developed rear axle final drive hypoid gear set is available for each engine/gearbox combination. During the design of the hypoid gear sets, particular attention was paid to achieving the vehicle acoustics objectives.

#### 3.4.2. Front axle differential

Reducing the power loss was also an important goal during the development of the front axle differentials, coupled with the specification to reduce fuel consumption and weight differences between rear wheel and four-wheel drive to a minimum. In order to be able to use common parts, identical angular-contact ball bearings are used as in the rear axle final drive with the same positive result.

# E84 Complete Vehicle

## 3. Powertrain

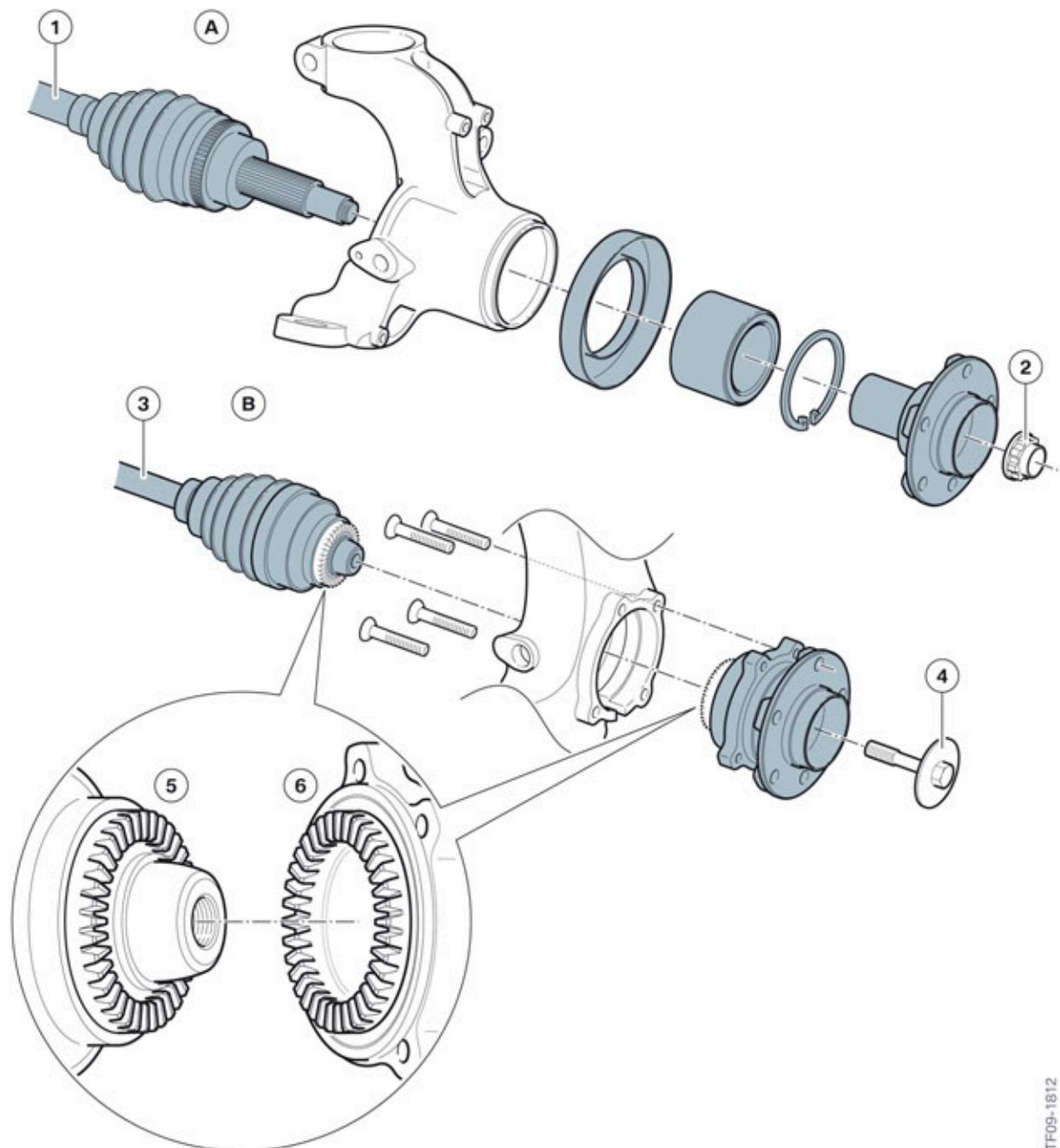
### 3.5. Output shafts, front axle

The front output shafts transfer the torque to the front wheels. The movement of the assemblies (engine/ transmission, bearings, rear axle) along with the spring travel of the wheels and angle changes in the drivetrain must be balanced out during this process. The front output shafts in an xDrive vehicle must take up large deflection angles caused by the steering angle at the wheel hubs. The output shafts must also be capable of transferring the maximum torque applied to them.

Up till now, output shaft journals with longitudinal splines have been used for the axle to wheel hub connection. This connection is made by machining spur gears on both the axle and the wheel hub mating surfaces. When these components are then torqued to specifications the result is comparable to the conventional spline method. This system (first introduced in the US with the F25 X3) simplifies the installation of the drivetrain at the assembly plant and reduces manufacturing costs.

# E84 Complete Vehicle

## 3. Powertrain



E84 front output shaft to wheel hub connection

TF09-1812

Index	Explanation
A	Conventional output shaft
B	Output shaft with spur gear connection
1	Front output shaft, with spur gear (wheel side)
2	Castle nut

# E84 Complete Vehicle

## 3. Powertrain

Index	Explanation
3	Front output shaft, with spur gear (welshed)
4	Retaining screw
5	Output shaft with spur gear connection
6	Mating spur gear connection at wheel hub



Cutaway view of the new front axle spur gear connection to the wheel hubs



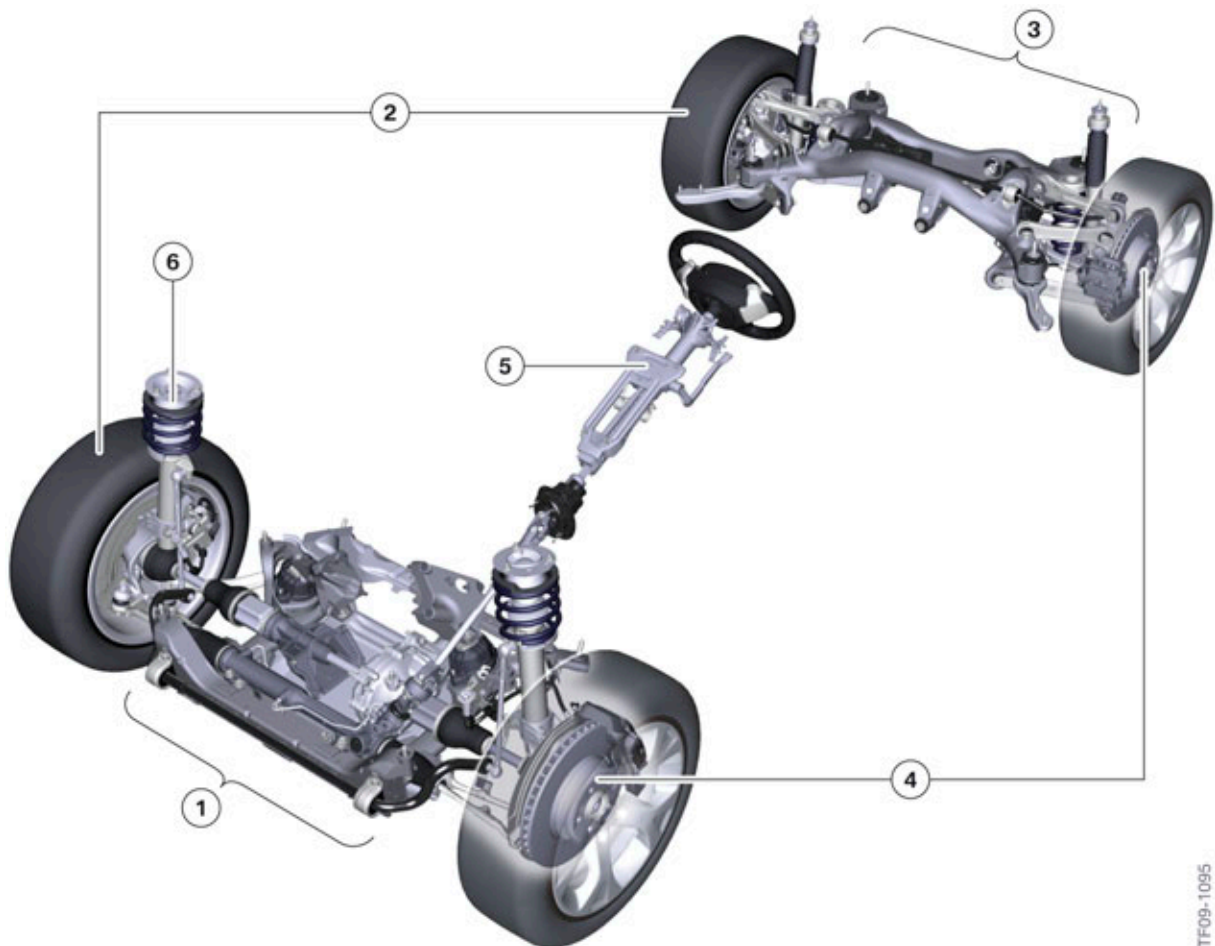
# E84 Complete Vehicle

## 4. Chassis

Since there are two generally different powertrain versions for the BMW X1 (sDrive and xDrive), the chassis layout also differs.

### 4.1. Chassis

#### 4.1.1. Chassis components



BMW X1 chassis components

Index	Explanation
1	Front axle
2	Wheels/tires
3	Rear axle
4	Brakes
5	Steering
6	Suspension/damping

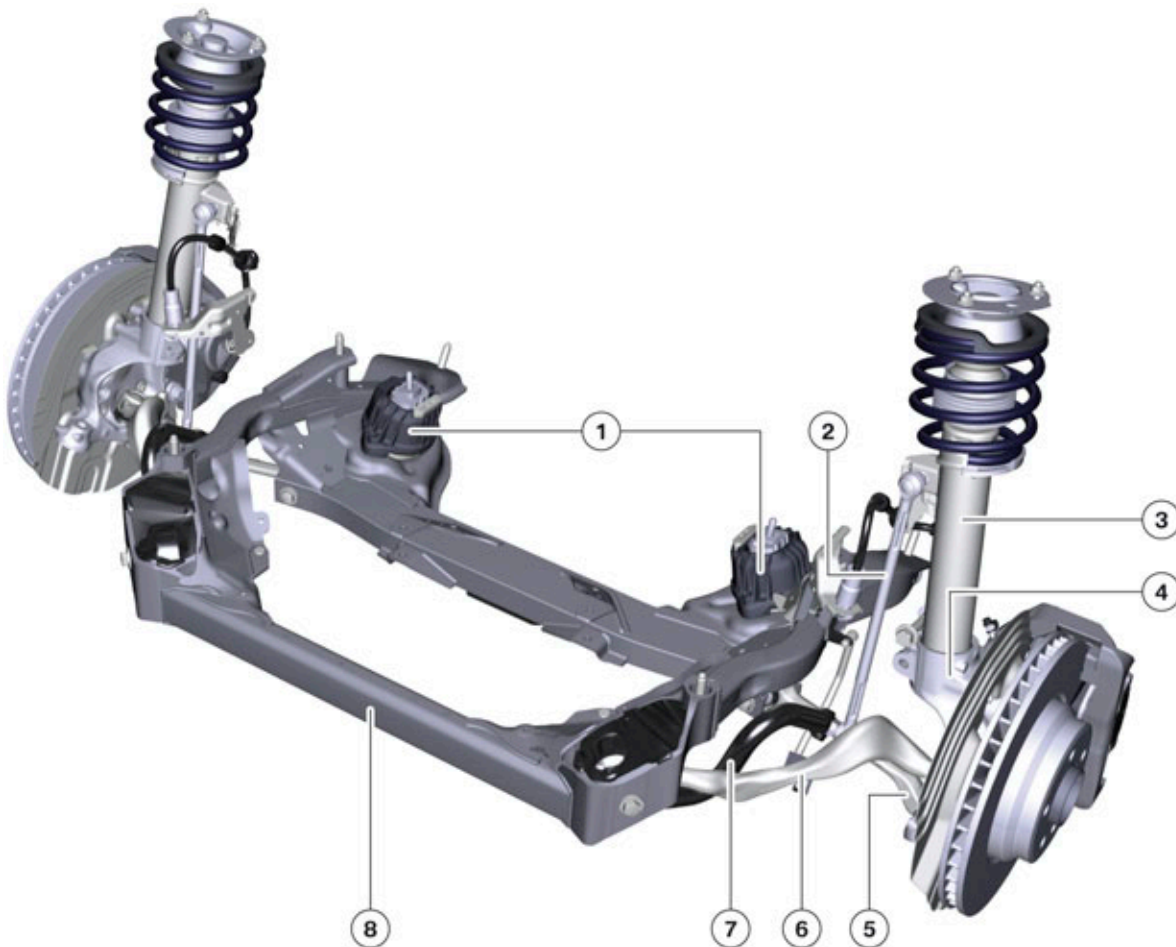
TF09-1095

# E84 Complete Vehicle

## 4. Chassis

### 4.1.2. Front axle

A double-pivot spring strut front axle in the BMW X1 allows for the best possible coordination of kinematics with regard to particularly good vehicle agility and good driving dynamics.



TF09-1096

BMW X1 sDrive double-pivot spring strut front axle with trailing links.

Index	Explanation
1	Engine mount
2	Anti-roll bar link
3	Spring strut
4	Swivel bearing (Aluminum)
5	Wishbone
6	Trailing links (Aluminum)
7	Anti-roll bar
8	Front axle support (Aluminum)

# E84 Complete Vehicle

## 4. Chassis

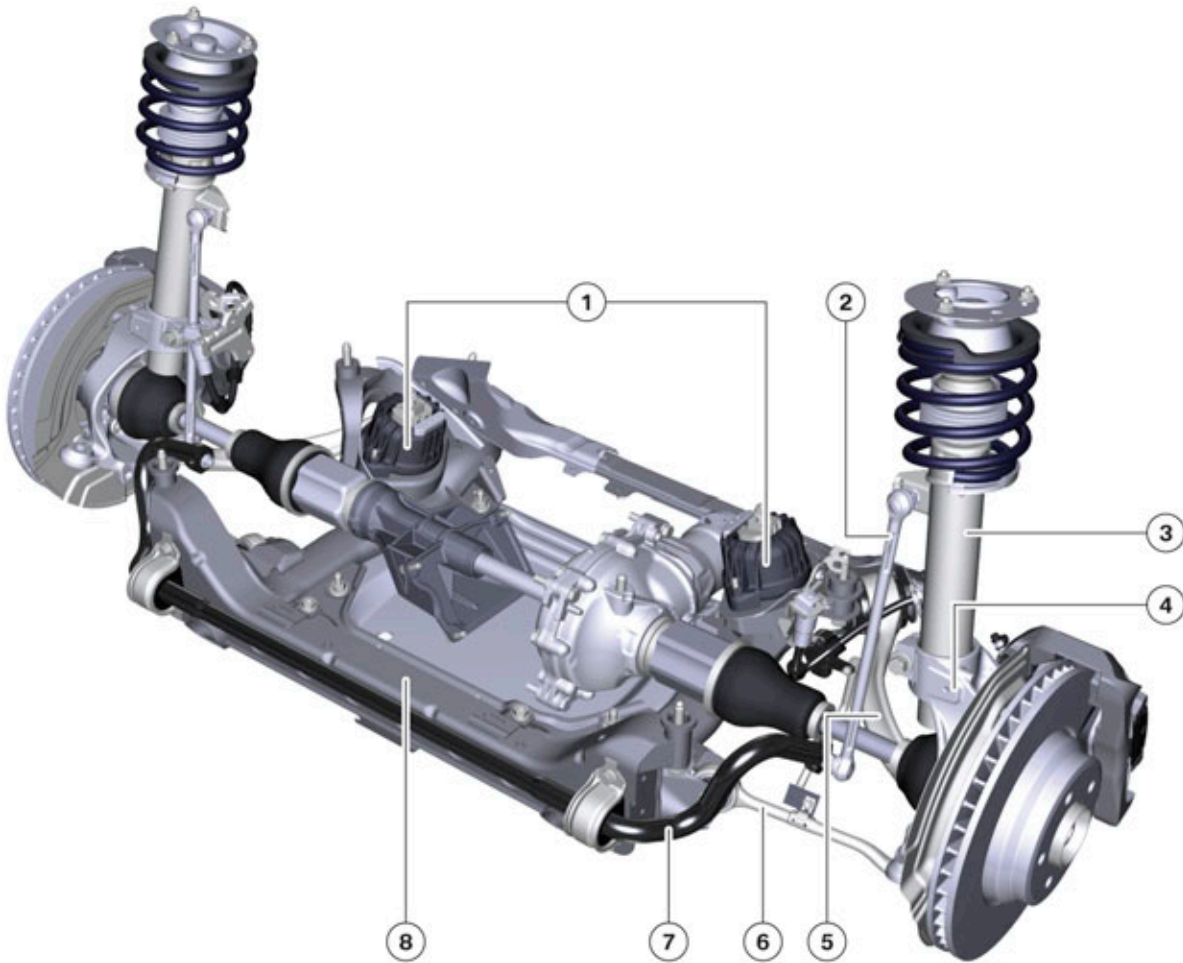
In the sDrive28i with the standard rear wheel drive, a double-pivot spring strut front axle that is made of aluminium and fitted with trailing links. This design of the front axle is identical to that used in the BMW 1 Series and 3 Series. The aluminium material of trailing arms and swivel bearings (forged) reduce the unsprung masses. The aluminium front axle support (forged from various individual parts) also reduces the front axle load and thus permits a more favorable weight distribution while at the same time providing optimum stiffness of the front end. The height adjustment of the BMW X1 with respect to the BMW 3 Series Sport Wagon is implemented by a modification to the swivel bearing.

The most important data of the BMW X1 front axle is compiled in the following table.

Standard wheel	R17 7.5Jx17 EH2+
Standard tire	225/50 R17 94H (RSC)
Rim offset	34 mm (1.33 in)
Toe-in	14'
Track width	1500 mm (59.1 in)
Camber	-18' ± 25'
Camber difference angle	Max. 30'
Overall toe-in	-14' ± 10'
Toe difference angle	1° 37' ± 30'
Caster angle	6° 26'

# E84 Complete Vehicle

## 4. Chassis



BMW X1 xDrive double-pivot spring strut front axle with leading links.

Index	Explanation
1	Engine mount
2	Anti-roll bar link
3	Spring strut
4	Swivel bearing
5	Leading links (Steel)
6	Wishbone
7	Anti-roll bar
8	Front axle support

# E84 Complete Vehicle

## 4. Chassis

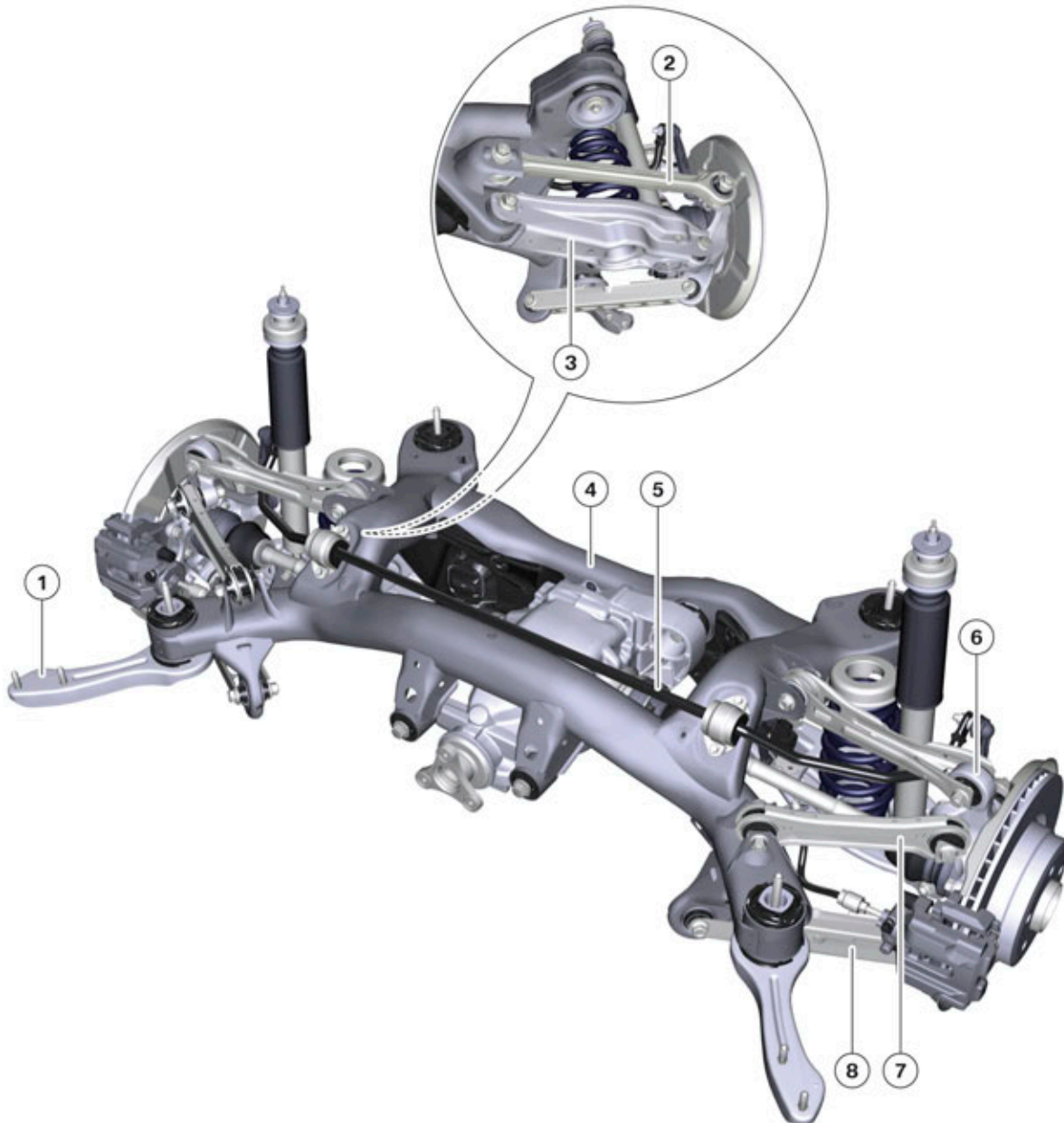
In the xDrive28i and xDrive35i with four-wheel drive, a double-pivot spring strut front axle that is made of steel and fitted with leading links. Minor changes to realize the height adjustment were made in the area of the link bearing supports.

Standard wheel	R17 7.5Jx17 EH2+
Standard tire	225/50 R17 94H RSC
Rim offset	34 mm (1.33 in)
Toe-in	14'
Track width	1501 mm (59.1 in)
Camber	-27' ± 25'
Camber difference angle	Max. 30'
Overall toe-in	-14' ± 10'
Toe difference angle	1° 38' ± 30'
Caster angle	6° 35'

# E84 Complete Vehicle

## 4. Chassis

### 4.1.3. Rear axle



TF09-1098

Rear axle BMW X1, xDrive/sDrive

# E84 Complete Vehicle

## 4. Chassis

Index	Explanation
1	Compression strut
2	Toe link
3	Camber link
4	Rear axle support
5	Anti-roll bar
6	Wishbone
7	Control arm
8	Trailing arm

The most important data of the BMW X1 rear axle is compiled in the following table.

Standard wheel	R17 7.5Jx17 EH2+
Standard tire	225/50 R17 94H RSC
Rim offset	34 mm (1.33 in)
Wheelbase	2760 mm (108.7 in)
Track width	1529 mm (60.2 in)
Camber	-1° 30' ± 5'
Camber difference angle	0° ± 30'
Overall toe-in	18' ± 4'
Driving axle angle	0° ± 12'

A five-link rear axle HA5 as known from the E8x and E9x is installed. This design features a particularly precise wheel control and offers excellent dynamic properties with regard to the following:

- Directional stability
- Load reversal behavior
- Self-steering response
- Lane change stability
- Transition behavior from cornering to straight-running stability (steering)

The HA5 in the BMW X1 offers very good tire comfort due to a double-elastic mounts and a large support base of the rear axle. Furthermore, the design principle of the HA5 does not require a lot of installation space and has a low weight.

The five-link rear axle is mainly derived from a twin control arm rear axle with the track rod located in the rear, whereby the upper and lower A-arms were replaced by two individual arms each. The advantage of this is that, regardless of the installation space situation, it is possible to freely specify the ef-

# E84 Complete Vehicle

## 4. Chassis

fective virtual kinematics point. The result of this design coordination is elasto-kinematics properties that permit exact wheel control across significant spring travel, which is required for the desired driving properties. In addition, due to small lever arms, the rear axle barely reacts to interferences.

The large support base for toe and camber on the wheel carrier side and the extremely torsionally rigid trailing arms, as well as the stiff rear axle support and the connection to the body by means of compression struts ensure highly precise wheel control. This is the prerequisite for agile overall coordination of the BMW X1. The use of high-torque engines as well as the use of run flat tires were taken into consideration by the large rear axle support base; this concept is very important both for driving properties as well as for good acoustic insulation.

Many of the rear axle components of the BMW 3 Series Sport Wagon are being adopted for the BMW X1. Only the hub carrier and the upper wishbone were redesigned for the height adjustment necessary in the BMW X1. For the rear axle support, only the rear crossbridge with the connection for camber link and toe link had to be redesigned; the remaining components are identical to the rear axle support in the BMW 3 Series Sport Wagon.

The HA5 provides the best prerequisites for the particularly space-saving rear concept (location of rear seat position, fuel tank, and luggage compartment). Thus, a comparably large through-loading width as well as ample leg room can be achieved in the rear.

### 4.1.4. Steering systems

Depending on the model and equipment, the following different steering systems are used in the BMW X1:

- Electric power steering with the parallel arrangement of the electric motor (sDrive28i only) without Servotronic
- Hydraulic steering with an 18.5 steering ratio
- Servotronic (SA216), available only for hydraulic steering

The EPS in the BMW X1 makes a major contribution to the reduction of CO<sub>2</sub> emissions due to the demand-oriented control of the assisted torque.

Electric power steering EPS is only offered in the sDrive28i rear wheel drive version.

The xDrive models for all other markets are offered with the hydraulic steering system adopted from the E8x and E9x.

Servotronic (SA216) is standard on the xDrive35i and available as an option on the xDrive28i.

### 4.1.5. Brakes

The BMW X1 is equipped with floating calliper brakes. The top model xDrive28i is the only model that has a floating calliper brake in the frame construction at the front axle. All brake discs are ventilated.



# E84 Complete Vehicle

## 4. Chassis

The following table provides an overview of the versions that are being used:

Model	Front brake piston Ø in mm	Rear brake piston Ø in mm	Front brake disc Ø in mm x thickness in mm	Rear brake disc Ø in mm x thickness in mm
BMW X1 sDrive28i	57	44	312 x 24	300 x 20
BMW X1 xDrive28i	57	44	330 x 24	300 x 20
BMW X1 xDrive35i	57	44	348 x 30	336 x 22

### 4.1.6. Suspension/damping

The BMW X1 is only offered with conventional spring struts at the front and rear axle.

### 4.1.7. Wheels

The sDrive28i and xDrive28i are equipped with the ZRF Run-flat tires package as standard. The ZRF Run-flat tires package consists of tires with emergency running properties, 17 inch standard wheels and the Extended Hump 2+ EH2+ rims, as well as the Run Flat Indicator.

The xDrive35i is standard equipped with 18 inch but 19 inch wheels are available as optional equipment.

This ZRF Run-flat tires package consists of the following:

- RSC tires with emergency running properties on an EH2+ rim
- Tire pressure monitor
- Elimination of spare wheel
- Elimination of jack

## 4.2. Driving stability control systems

### 4.2.1. Dynamic Stability Control DSC

The familiar DSC Bosch 8+ is used in the BMW X1. It has to be observed here in particular that the DSC control unit in a BMW X1 with rear wheel drive is not identical to a DSC control unit from the BMW X1 with xDrive. The coordination of the DSC/DTC mode varies in the two different engine versions.

The DSC sensor cluster is located below the left seat and consists of a longitudinal, transverse, and yaw rate sensor.

# E84 Complete Vehicle

## 4. Chassis

Function	Can be activated/de-activated	DSC ON	DTC	DSC OFF
ABS		●	●	●
EBV		●	●	●
CBC		●	●	●
MSR		●	●	●
ASC		●	X	
ADB-X		●	●	●
DSC	◇	●	X	
HDC	◇	●	●	●
Brake drying		●	●	●
Drive-off assistant		●	●	●
Brake standby		●	●	●
Fading support		●	●	●
DBC		●	●	●
DBS		●	●	●
MBS		●	●	●

### Symbols:

- = System active
- X = System with raised control thresholds
- ◇ = Can be activated or deactivated.
- Note: The table on the following page describes the acronyms.**

The purpose of the table is to illustrate the functions of the driving stability control systems. The functional capability with regard to DSC/DTC for the BMW X1 xDrive was adopted from the BMW 3 Series xDrive and for the BMW X1 sDrive from the BMW Z4 sDrive and expanded for both with the tilt stabilization logic system from the BMW X5 due to the higher position of the center of gravity.

For the 6-cylinder models, the additional functions such as drive-off assistant, fading compensation, brake standby, and drying by applying brake are already available in the standard equipment.

As with F25 the BMW X1 xDrive models are also offered with the (optional) 2VG Performance Control function (dynamic brake intervention), refer to Section 4.2.3 for more information. The DSC 8+ with its pulse-width-modulated activation for the analogue separator and intake valves allows for an analogue valve characteristic, which permits sensitive pressure control. As a result, higher control comfort in all DSC functions as well as in the optional equipment Dynamic Cruise Control (DCC) is achieved.

# E84 Complete Vehicle

## 4. Chassis

Function	Description
ABS	Anti-Lock Braking System
EBV	Electronic Brake Force Distribution
CBC	Corner Brake Control
MSR	Engine Drag Torque Reduction
ASC	Automatic Stability Control
ADB-X	Automatic Differential Lock/Brake X (special function for all-wheel drive vehicles)
DSC	Dynamic Stability Control
HDC	Hill Descent Control
Brake drying	When the windshield wiper is operating in continuous wipe mode, the wheel brakes are lightly applied against the brake disc cyclically every 90 seconds in order to wipe off the water film.
Drive-off assistant	This function provides assistance when driving off on uphill gradients by temporarily maintaining brake pressure in the wheel brakes.
Brake standby	The brake pads are applied against the brake disc when the accelerator pedal is released quickly thus reducing the emergency braking stopping distance (by approx. 30 cm/100 km/h).
Fading support	If the braking effect diminishes, the driver is assisted by the fading compensation with additional pressure build-up of the DSC module.
DBC	Dynamic Brake Control (see E60)
DBS	Dynamic Brake Support (see E60)
MBS	Maximum Brake Support (see E60)

### 4.2.2. xDrive with transfer case

#### System design

The linked systems xDrive and DSC mainly consist of the components already known from the DSC:

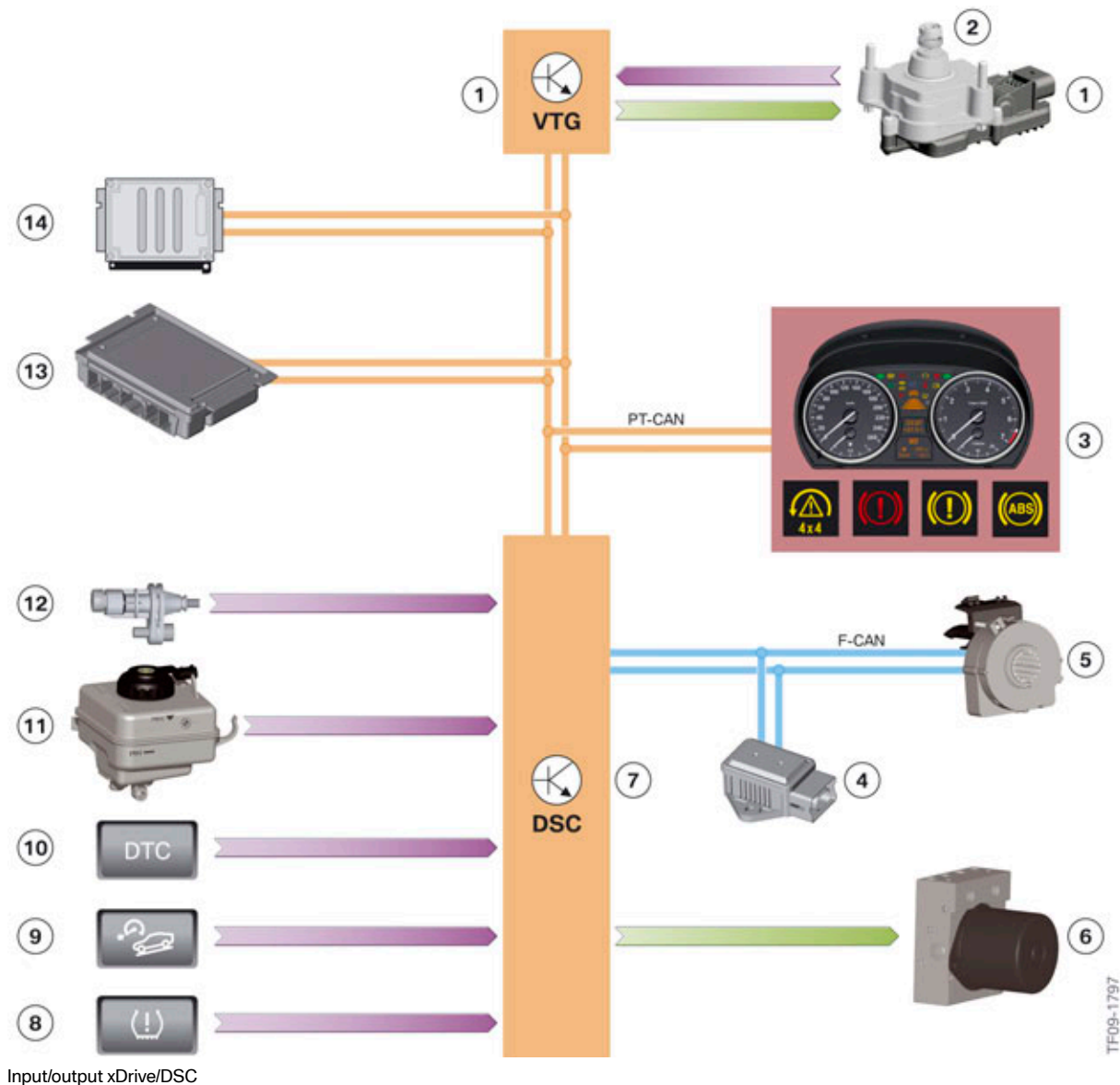
- Controlled multi-disc clutch in the transfer case
- DSC8+ module
- Longitudinal dynamics management
- DSC sensor
- Wheel speed sensors
- Brake pressure sensor
- Steering angle sensor
- Brake fluid level switch
- Brake light switch

# E84 Complete Vehicle

## 4. Chassis

- DTC button
- Motor position sensor for transfer case (incremental sensor)
- Transfer case control motor (actuator)

### Input/output xDrive/DSC



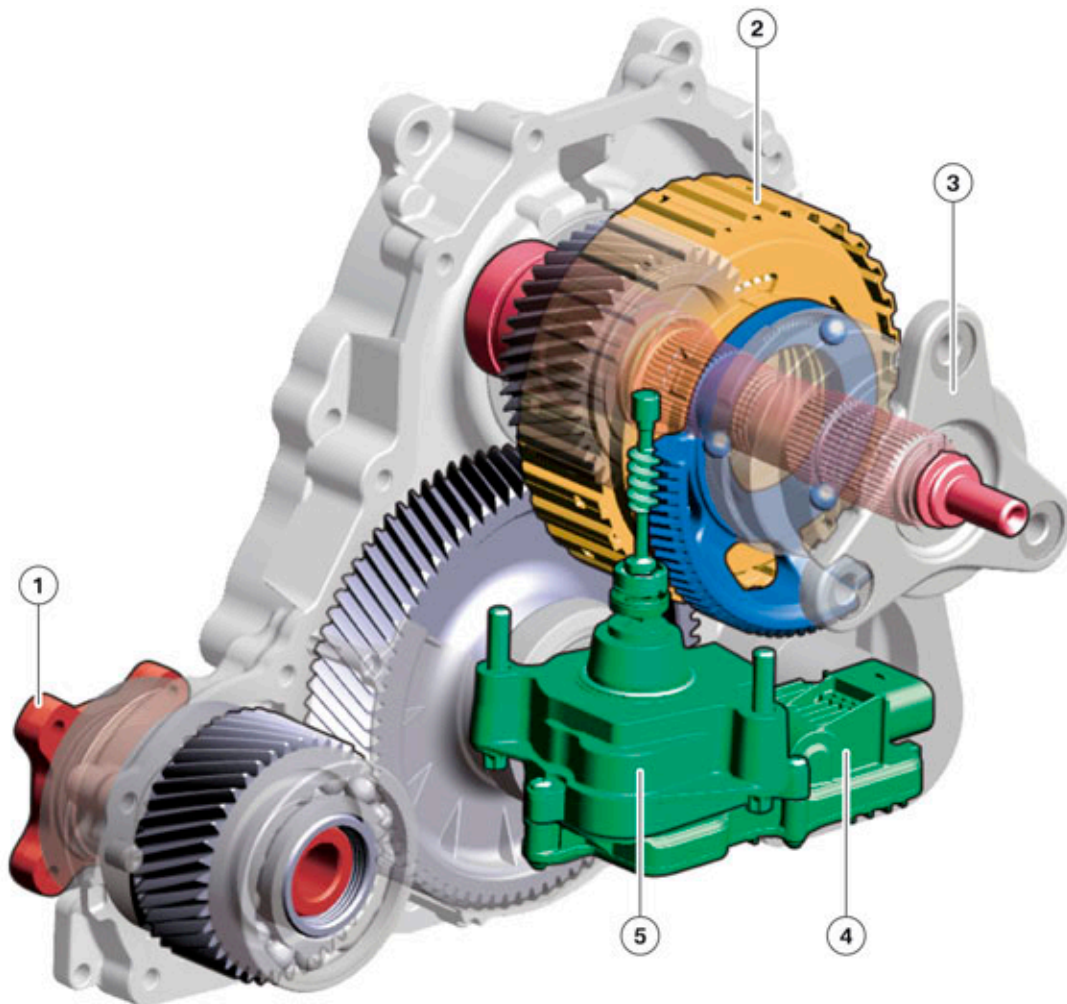
# E84 Complete Vehicle

## 4. Chassis

<b>Index</b>	<b>Explanation</b>
1	Transfer case control unit (VTG)
2	Transfer case clutch actuator
3	Instrument cluster
4	DSC sensor (rotational speed, lateral, and longitudinal acceleration sensor)
5	Steering angle sensor
6	Dynamic Stability Control (DSC) hydraulic unit
7	Dynamic Stability Control (DSC) control unit
8	RPA button (Not for US)
9	HDC button
10	DTC button
11	Brake fluid level switch
12	Wheel speed sensor
13	Electronic Transmission Control (EGS)
14	Digital Motor Electronics (DME)

# E84 Complete Vehicle

## 4. Chassis



TF09-1099

Mechanical design of the transfer case (ATC 350)

Index	Explanation
1	Connection to the front axle
2	Connection to the gearbox (clutch package)
3	Connection to the rear axle
4	Transfer case control unit
5	Control motor for actuating the multi-disc clutch

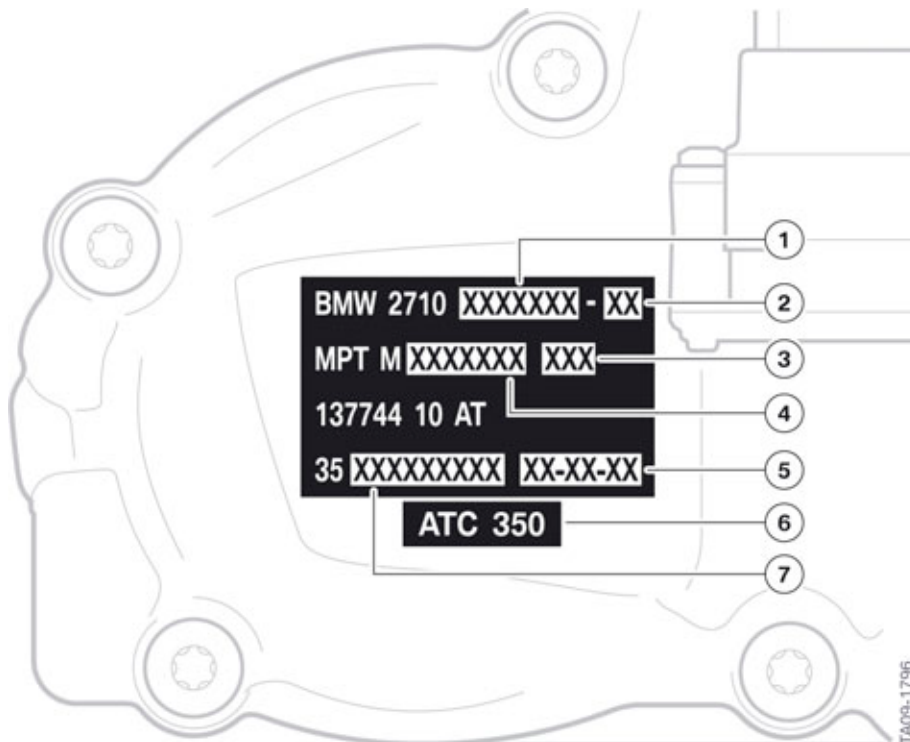
### New features in the xDrive

A combination of actuator and xDrive control unit is directly installed on the transfer case of the BMW X1. The control unit is now referred to as "transfer case".

# E84 Complete Vehicle

## 4. Chassis

In comparison to the previous one (ATC 300), the new transfer case (ATC 350) features a spur gear unit which makes better use of the installation space. While previous transfer boxes used to have a "coding and service resistor", it has been eliminated in the new transfer boxes. The compensation of the production tolerances in the transfer case which was previously achieved by the coding resistor is now accomplished via an internal classification that can also be found on the type plate.



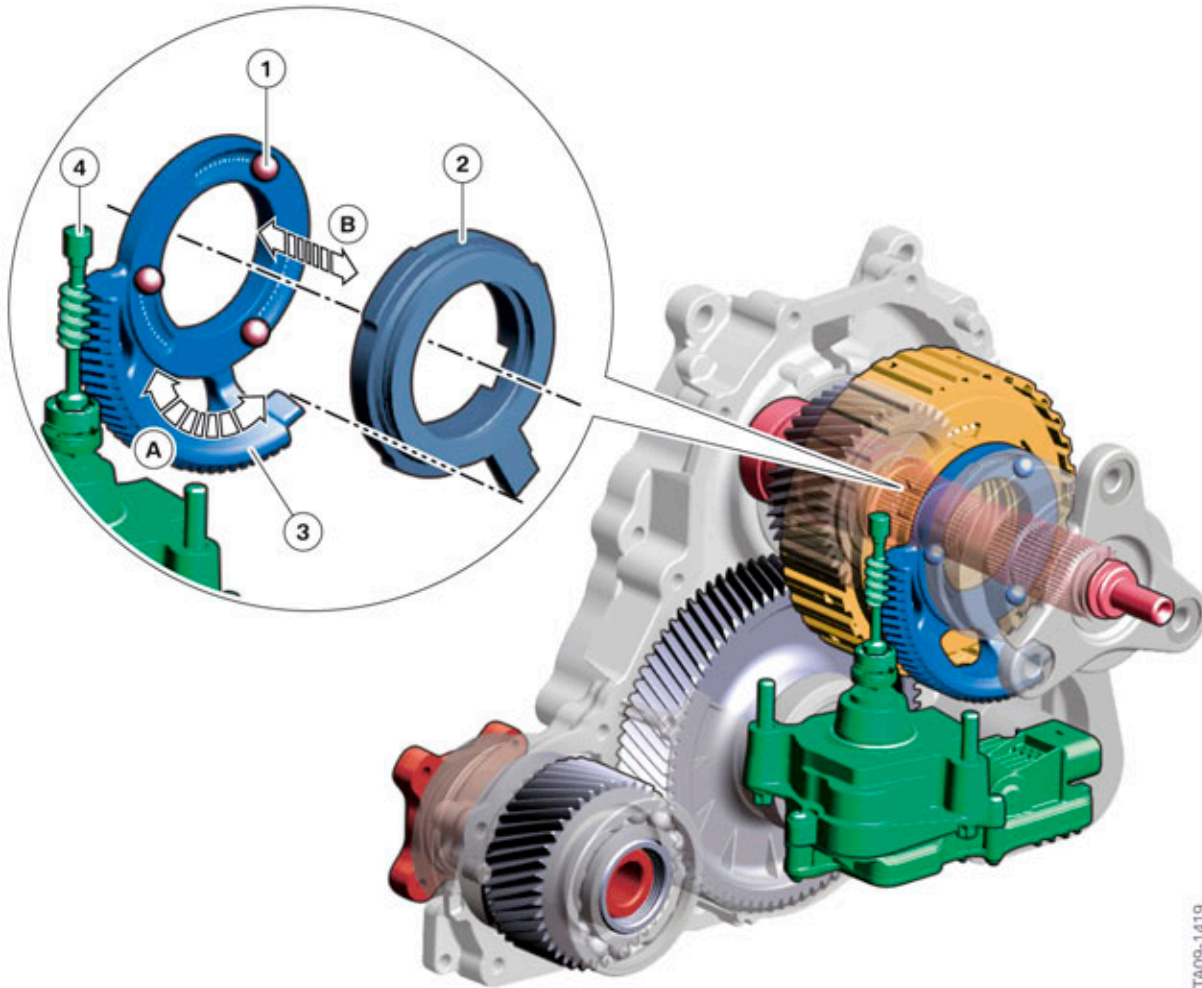
Type plate

Index	Explanation
1	BMW part number
2	Revision index
3	Classification
4	Magna Powertrain part number
5	Production date (day/month/year)
6	Transfer case type
7	Serial number

The separate oil pump in the transfer case has also been eliminated, which leads to an improvement in efficiency. Adequate lubrication and cooling of the transfer case components is achieved through an oil supply function of the power transmission system (spur gear unit). The transformation of the radial movement into an axial movement in order to operate the multi-disc clutch has changed slightly.

# E84 Complete Vehicle

## 4. Chassis



Activation of the multi-disc clutch

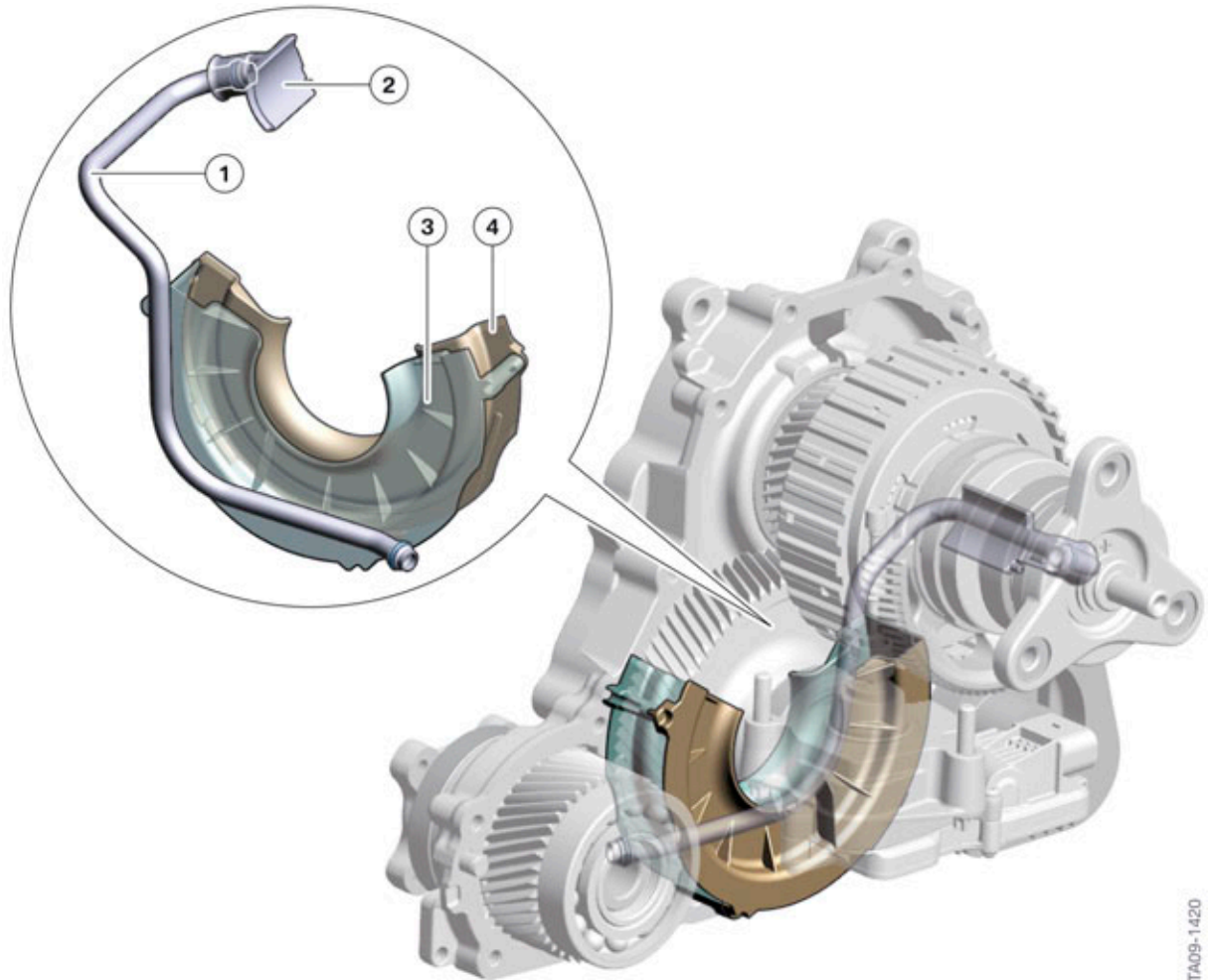
Index	Explanation
A	Radial movement
B	Axial movement
1	Balls (3x)
2	Ball ramp
3	Worm wheel with ball ramp
4	Worm gear



# E84 Complete Vehicle

## 4. Chassis

### Oil supply



Oil supply

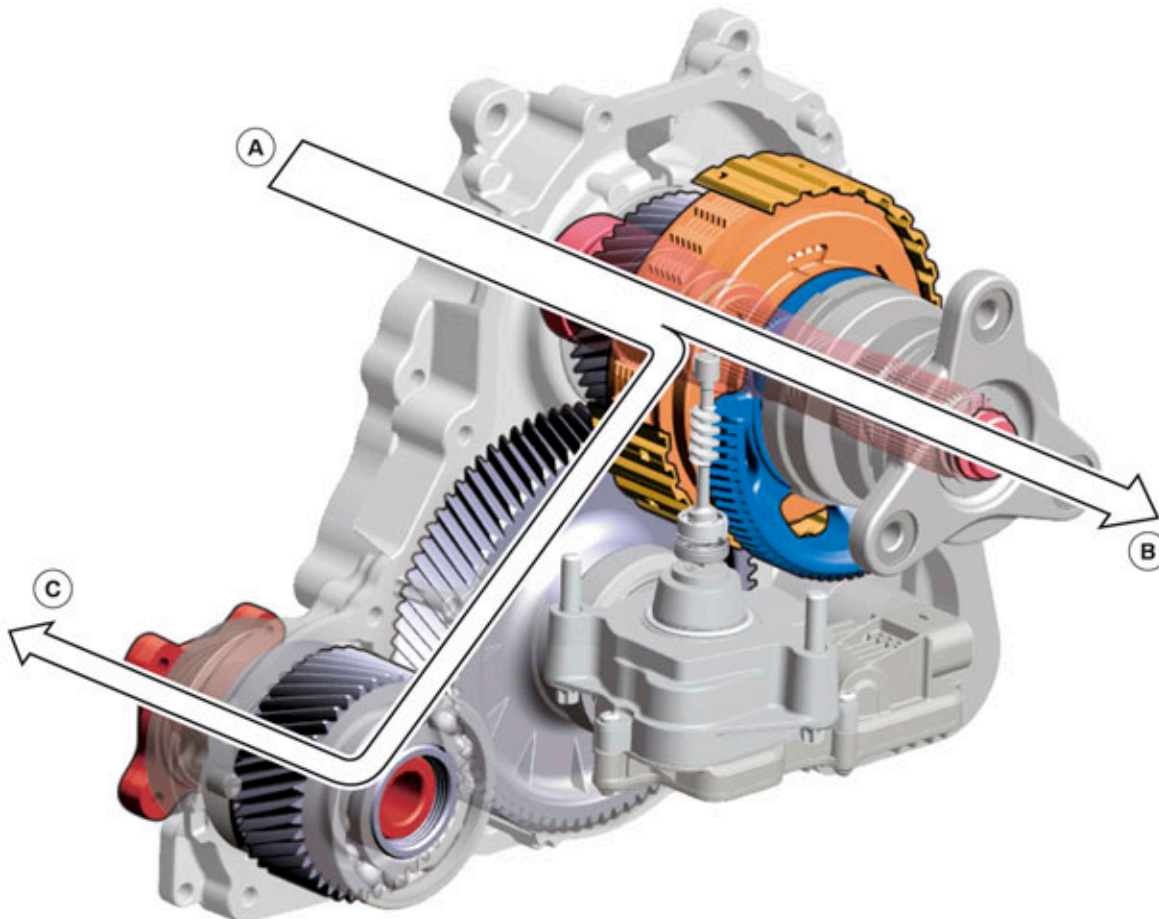
Index	Explanation
1	Connecting pipe of front axle gearbox input shaft and rear axle gearbox input shaft
2	Connection of rear axle gearbox input shaft
3	Inner oil duct
4	Outer oil duct

### Function

The actuator with the integrated control unit of the transfer case activates the multi-disc clutch in the transfer case. In the normal function, the target torque request by the VTG is received by the DSC via the interface. The DSC has the VTG software and converts the target torque request (0-1400 Nm) via a characteristic into target angle information on the control motor drive.

# E84 Complete Vehicle

## 4. Chassis



TA09-1421

Drive torque

Index	Explanation
A	Engine/transmission drive torque
B	Portion of rear axle drive torque
C	Portion of front axle drive torque

### 4.2.3. Performance Control

The customer can order the "2VG performance control" optional equipment for the BMW X1 as part of the ZMP M Sport Package (xDrive vehicles only). Already known from F25 X3, this DSC function for the xDrive in the BMW X1 is a dynamic intervention function that can be neither switched on or off. The principle for enhancing the agility of the xDrive vehicle is similar to the Dynamic Performance Control function in the BMW X6. Variable torque distribution on the rear axle is achieved here by the dynamic performance control. During performance control, the inner cornering rear wheel is braked during sporty driving and the generated braking torque is at the same time compensated through an intervention in the engine load control system. This generates a driving torque that reduces the steering angle and the tendency of an xDrive vehicle to understeer.

# E84 Complete Vehicle

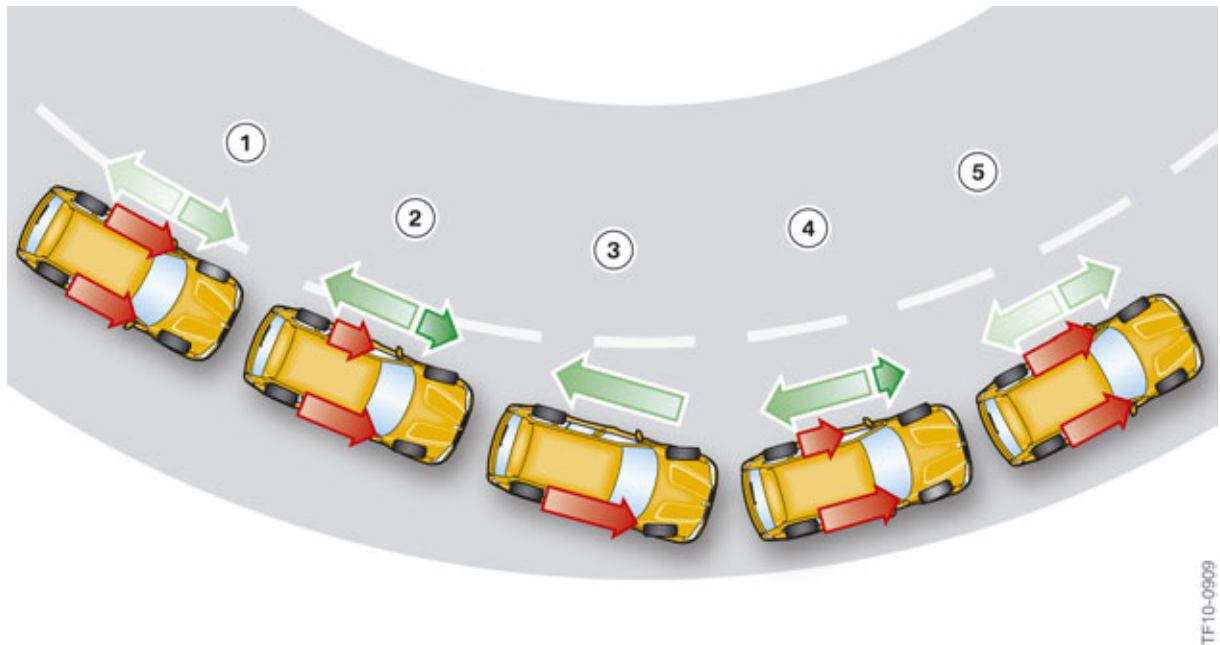
## 4. Chassis

In order to avoid increased brake wear, the function is switched back in stages between speeds of 60 Km/h (37 mph) and 120 km/h (75 mph) and at speeds of 120 km/h (75 mph) and higher this agility function is no longer used.

### Understeering

In an understeering driving situation, xDrive shifts more drive torque to the rear axle as the understeering tendency increases. This allows the front axle to build up more traction which reduces understeering.

At the same time the Performance Control (SA 2VG) ensures **(through braking intervention at the inner rear cornering wheel and by increasing the drive torque of the engine)** that the vehicle adopts a neutral drivability without slowing it down.



E84 xDrive and Performance Control intervention during understeering

Index	Explanation
red arrow	Performance Control intervention
green arrow	xDrive intervention
1	On the approach to the bend, xDrive adjusts the distribution of drive torque so the emphasis is slightly towards the rear
2 and 3	During cornering, xDrive shifts more drive torque to the rear axle; Performance Control counteracts understeering
4	As the understeering tendency reduces, more drive torque is directed to the front axle and the intervention by Performance Control diminishes
5	xDrive reestablishes the standard distribution, intervention by Performance Control is no longer required

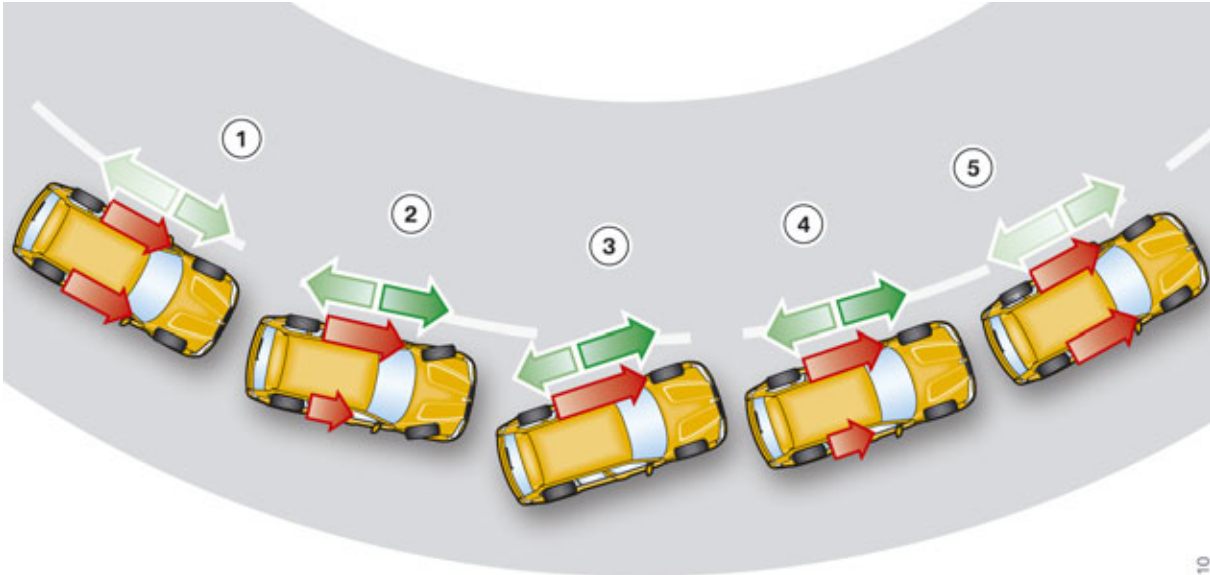
# E84 Complete Vehicle

## 4. Chassis

### Oversteering

In an oversteering driving situation, xDrive distributes the drive torque so that the load on the rear axle is reduced as much as possible.

At the same time, the DSC ensures **(through additional brake intervention at the outer rear wheel during cornering)** that the vehicle is quickly stabilized and that neutral drivability is restored.



TF10-0910

E84 xDrive and Performance Control intervention in the event of oversteering

Index	Explanation
red arrow	Performance Control intervention
green arrow	xDrive intervention
1	On the approach to the bend, xDrive adjusts the distribution of drive torque so the emphasis is slightly towards the rear
2	If an oversteering tendency exists, xDrive shifts more drive torque to the front axle
3	As the oversteering tendency increases, Performance Control (SA 2VG) further stabilizes the vehicle through braking intervention at the outer rear wheel during cornering
4	As the oversteering tendency reduces, less drive torque is directed to the front axle and the intervention by Performance Control diminishes
5	xDrive reestablishes the standard distribution, intervention by Performance Control is no longer required

# E84 Complete Vehicle

## 4. Chassis

### 4.2.4. Dynamic Cruise Control (DCC)

The extension of the conventional speed control by a comfortable brake intervention known from the BMW 3 Series leads to an extended application range with the following new operation options:

- With the help of an "electronically controlled brake actuation" ECBA interface to the DSC, the vehicle speed is reduced in a considerably more dynamic manner via a brake intervention
- In the application range from 30 km/h (18 mph) to 250 km/h (155 mph), certain "hand throttle functions" are possible on the operating lever.

# E84 Complete Vehicle

## 5. General Vehicle Electronics

### 5.1. Electrical system

The electrical systems of the BMW X1 correspond for the most part to the BN 2000 vehicle electrical system of the BMW 1 Series (E8x) and 3 Series (E9x) vehicles. The vehicle electrical system for example includes the junction box, the footwell module, and the roof function center as vehicle electrical system components with the already known functions.

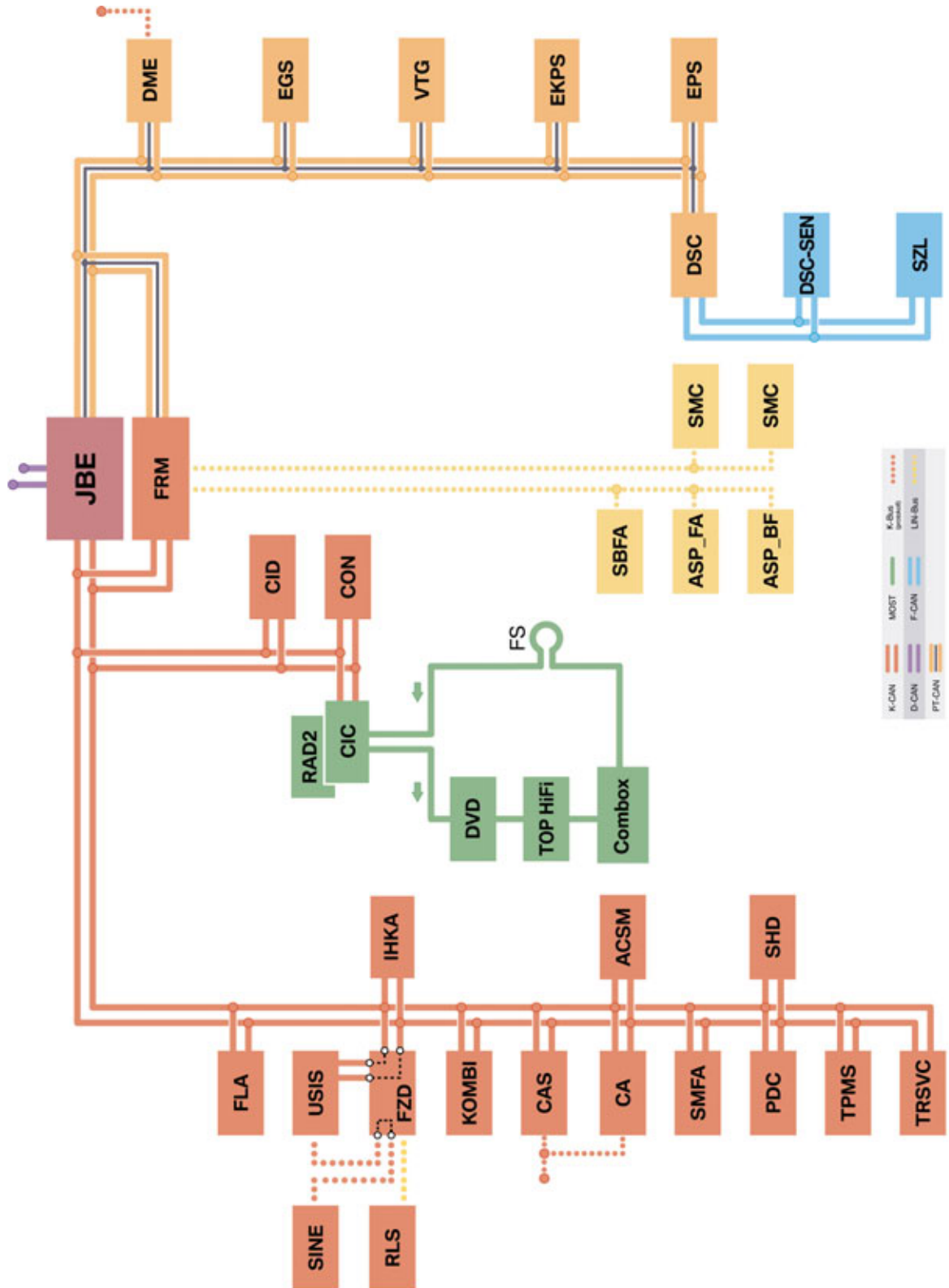
The following items are new features or modifications compared to the BMW 1 Series BMW 3 Series:

- MOST
  - Car Information Computer (CIC), (refer to ST815 CIC training material for more information on ICP and TIS)
- K-CAN
  - Top rear side view camera (TRSVC), refer to product information ST811 F01 Complete Vehicle for more information on ICP and TIS.
- PT-CAN
  - Transfer case, refer to xDrive with Transfer case in the Powertrain section.

# E84 Complete Vehicle

## 5. General Vehicle Electronics

### 5.1.1. Bus systems





# E84 Complete Vehicle

## 5. General Vehicle Electronics

<b>Index</b>	<b>Explanation</b>
ACSM	Advanced Crash Safety Module
CA	Comfort Access
CAS	Car Access System
CIC	Car Information Computer
CID	Central Information Display
CON	Controller
DME	Digital Motor Electronics
DSC	Dynamic Stability Control
DSC-SEN	Dynamic Stability Control Sensor
DVD	DVD changer
EGS	Electronic transmission control
EKPS	Electronic fuel pump control
EPS	Electric Power Steering
FLA	High beam assistant
FRM	Footwell module
FZD	Roof function center
GWS	Gear selector switch
IHKA	Integrated automatic heating/air conditioning system
JBE	Junction Box Electronics
KOMBI	Instrument cluster
PDC	Park Distance Control
RAD2	Radio BMW Professional
SBFA	Switch block, driver's side
SHD	Panorama glass roof
SINE	Siren with tilt alarm sensor
SMFA	Driver's seat module
SMC	Stepper Motor Controller
SZL	Steering column switch cluster
TPMS	Tire pressure monitoring system
TRSVK	Top rear side view camera
TOP HiFi	Top HiFi amplifier
USIS	Ultrasonic interior movement detector
VTG	Transfer case control unit

# E84 Complete Vehicle

## 5. General Vehicle Electronics

### 5.1.2. Vehicle circuit structure

The vehicle circuit structure for the BMW X1 is mainly based on the proven wiring harness concept of the E8x and E9x.

The noteworthy features of the vehicle circuit structure are listed below:

- The multi-section customer-specific wiring harness, multi-section wiring harness for cockpit
- The use of fiber-optic in the MOST bus
- The alternator line is installed on the underbody

With the customer-specific wiring harness, it is still possible (in some markets) to retrofit additional functions such as a telephone. By avoiding unnecessary interfaces and the implementation of a customer-specific wiring harness, an optimal product is created with regard to quality and weight.

### 5.1.3. Energy management

The energy management of the BMW X1 is divided into the following areas:

- Power management (PM)
- Terminal control
- Special energy functions

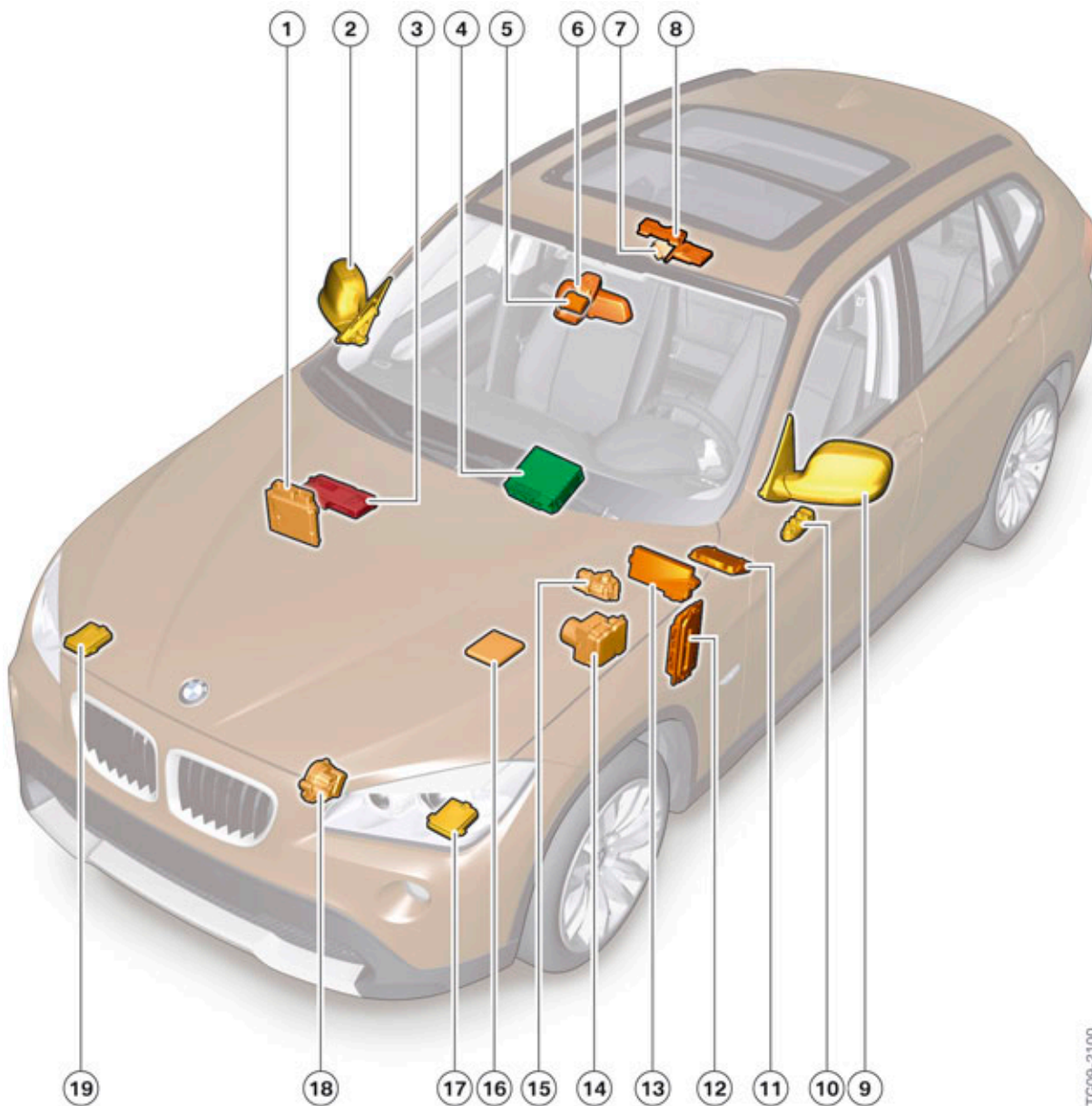
For a detailed description of energy management, refer to the product information for the E8x and E9x vehicles.

### 5.1.4. Installation locations of the system components

The following graphics show the installation locations of the BMW X1 system components.

# E84 Complete Vehicle

## 5. General Vehicle Electronics



TC09-2100

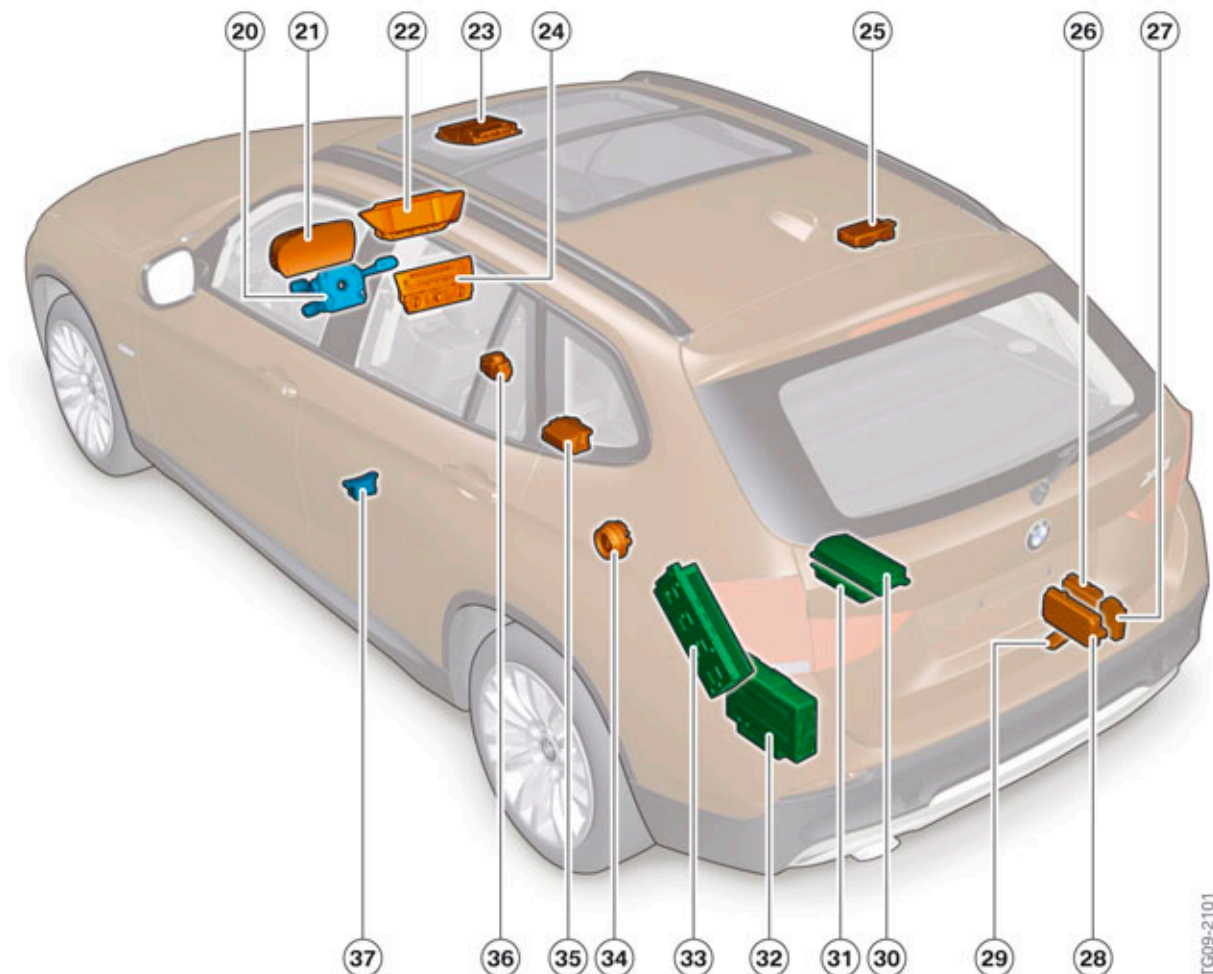
Installation locations of the system components in the BMW X1

Index	Explanation
1	Digital Motor Electronics (DME)
2	Exterior mirror, right
3	Junction Box Electronics (JBE)
4	Car Information Computer (CIC)
5	Rain, light and precipitation solar sensor
6	High beam assistant (FLA)
7	Electronic fuel pump control

# E84 Complete Vehicle

## 5. General Vehicle Electronics

Index	Explanation
8	Ultrasonic interior movement detector
9	Exterior mirror, left
10	Switch block, driver's side
11	Driver's seat module
12	Footwell module
13	Car Access System (CAS)
14	Dynamic Stability Control (DSC)
15	Transfer case control unit (VTG)
16	Electronic transmission control (EGS)
17	Stepper motor controller (SMC-L)
18	Electric Power Steering (EPS)
19	Stepper motor controller (SMC-R)



Installation locations of the system components in the BMW X1

TC09-2101

# E84 Complete Vehicle

## 5. General Vehicle Electronics

Index	Explanation
20	Steering column switch cluster
21	Instrument cluster
22	Central Information Display (CID)
23	Roof function center
24	Integrated automatic heating/air conditioning system (IHKA)
25	Panorama glass roof control unit
26	Park Distance Control (PDC)
27	(Not for US)
28	All-round vision camera (TRSVIC)
29	Tire pressure monitoring (US)
30	Combox
31	Universal charger and hands-free unit (Not for US)
32	DVD changer
33	Top HiFi amplifier (TOP HiFi)
34	Siren with tilt alarm sensor (SINE)
35	Crash safety module (ACSM)
36	Controller (CON)
37	DSC sensor

### 5.1.5. System components

This section outlines some notes on the most important system components, which are known in part from BMW 1 Series and 3 Series (E8x/E9x) vehicles.

For further detailed information on the general vehicle electrical system in the BMW X1, refer to the E8x and E9x training material available on ICP and TIS.

#### Front/rear locking system

The front/rear locking system of the BMW X1 is identical to that of the BMW 3 Series (E9x).

For a detailed description of the locking system, refer to the product information for the BMW 3 Series (E9x).

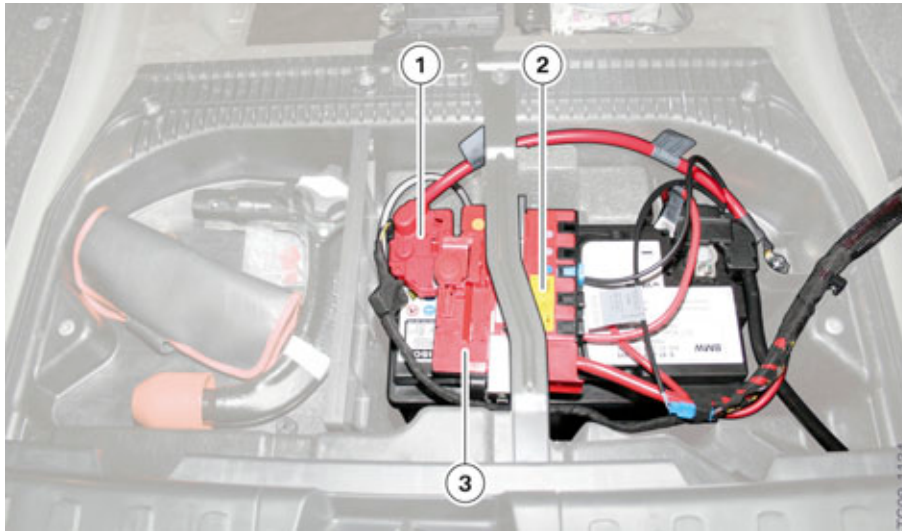
#### Power distribution box

As with the E8x and E9x Series vehicles, the BMW X1 features two power distribution boxes. The front power distribution box is located on the junction box electronics to the right in the direction of travel, below the instrument panel.

The rear power distribution box is located in the luggage compartment directly below the second storage shelf and is fixed in place on the vehicle battery with two clips.

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## 5. General Vehicle Electronics



Power distribution box in the luggage compartment of the BMW X1

Index	Explanation
1	Safety battery terminal (SBK)
2	Connector for high-current connections
3	Power distribution box

### 5.1.6. Display and operating concept

The display and operating concept in the BMW X1 corresponds for the most part to the operating concept of the BMW 1 Series. The principle of "fewer switches facilitates logical operation" is retained in the BMW X1.

The E84 LCI is equipped as standard with a storage compartment in the center of the dashboard. For vehicles which have an optional navigation system, the Central Information Display (CID) is arranged with side chrome applications. The center console is flatter on the side facing the driver.

Other new features in the area of the interior equipment are:

- Electroplated trims for the gear selector switch and cup holder
- Light switch with chrome wedge.

For a detailed description of the individual functions, refer to the product information for the BMW 1 Series and 3 Series as well as the Owner's Manual for the BMW X1.

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## 5. General Vehicle Electronics



BMW X1 display and operating concept

Index	Explanation
1	Light switch
2	Instrument cluster
3	Multifunction steering wheel
4	Central Information Display (CID)
5	Heating and air-conditioning system controls
6	Radio controls
7	Gear selector switch
8	Controller
9	Driver assistance systems controls

### Instrument cluster

The instrument cluster in the BMW X1 provides one analogue display each for

- Speed
- RPM
- Fuel level



# E84 Complete Vehicle

## 5. General Vehicle Electronics

Two large instrument dials show the speed and RPM. A small instrument dial in the engine speed display indicates the current fill level of the fuel tank.

The dials in the instrument cluster have different designs depending on the country, vehicle, and type of engine.

All of the indicator lights are centrally located at the top between the two large instrument dials.

The LC display is also located in the center, between the two large instrument dials.



BMW X1 instrument cluster

### Central Information Display (CID)

The Central Information Display (CID) is identical to the CID in the BMW 1 Series and 3 Series. As in all new BMW models, operation also takes place via the central operating element, the controller.

For further information, refer to the Owner's Manual for the BMW X1 vehicle.

### Heating and air conditioning unit

The BMW X1 comes standard with automatic 2-zone air conditioning system which is a further development of the heating and air conditioning unit installed in the BMW 1 Series and 3 Series. The air mass flow rate is increased due to fewer internal flow losses and the optimized fan wheel.

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### 5.1.7. Driver assist systems

#### Rearview camera

The rearview camera system is installed in the tailgate to the right next to the tailgate lock and is sealed with a rubber seal towards the tailgate.



Rearview camera

Index	Explanation
1	Rearview camera

The rearview camera is activated automatically together with the Park Distance Control (PDC) by engaging the reverse gear or manually by operating the button in the driver assist systems controls.

In the Central Information Display (CID), the wide angle color image of the surroundings directly behind the vehicle is shown. The graphic images show the pre-calculated space needed for parking and maneuvering relative to the current steering wheel position and assist the driver during parking.

The color obstacle marks in the camera image help the driver (in addition to the PDC warning sound) to pay attention to the obstacles during parking and maneuvering.

For further information, refer to the rearview camera in the BMW X5 E70 training material available on TIS and ICP.

#### Daytime driving lights

The BMW X1 is equipped with the typical BMW daytime driving lights that are integrated in the corona rings. The BMW X1 therefore meets the daytime driving lights requirements in all markets.

The daytime driving lights function is activated as standard when the vehicle is delivered and is implemented with an H8 bulb.

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## 5. General Vehicle Electronics



Daytime driving lights

TC09-1138

### **Adaptive headlights**

The adaptive headlights adjust their dynamics to the particular driving situation depending on the speed. On country roads at speeds from 60 to 100 km/h (37 to 62 mph), the headlights provide optimum curve area illumination and directly follow the driving dynamics of the vehicle. At interstate speeds, the control reduces the dynamic portions again, since continuous guidance and direction of movement are required.

For further information, refer to the product information for the adaptive headlights in the current BMW 5 Series and in the BMW X1 Owner's Manual.

### **High beam assistant**

As with the E8x and E9x Series vehicles, the high beam assistant is activated via the stalk on the steering column.

For further information, refer to the product information for the high beam assistant in the BMW 5 Series and in the BMW X1 Owner's Manual.

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## 5. General Vehicle Electronics

### Brake Force Display



Brake Force Display

Index	Explanation
A	Brake lights (under normal braking conditions)
B	Brake force display (under heavy braking)

The already illuminated brake lights are enhanced by the activation of an additional brake light (located on the tailgate “L” section) under heavy braking in the following conditions:

- The speed at the beginning of the braking operation was above 50 km/h (31 mph)
- The braking operation is supported by a continuous intervention of the brake system e. g. ABS control braking operation
- The braking operation is supported by the brake assistance system.

## 5.2. Entertainment and communication

### 5.2.1. Infotainment

#### Car Information Computer (CIC)

The BMW X1 is available with the Car Information Computer (CIC) as part of the ZTP Technology Package.

The ZTP Technology Package:

- Car Information Computer Professional.
- Navigation system (609)
- Voice-command (620)
- BMW Assist with Bluetooth (639)
- 6UH - Real Time Traffic Information
- 7KB - Navigation, BMW Assist w/enhanced BT & USB

# E84 Complete Vehicle

## 5. General Vehicle Electronics



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**Note: ZTP will delete 7H9 (Basic Bluetooth and USB ) from the order but will add 6UH and 7KB to the order.**

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The operating concept of the Car Information Computer is identical to the CIC installed in the BMW 1 Series and 3 Series.



TE09-0451

Controller

A detailed description of the main menu and the selection of the individual functions are outlined in the BMW X1 Owner's Manual.

Furthermore, you can find a detailed description of the system in the F01 Audio System training material available on TIS and ICP.

### 5.2.2. Entertainment

#### Rod-free antenna system "WING"

Due to the rear window layout "WING" patented by BMW, it is possible to omit the rod antenna. This layout was introduced for the first time in the BMW X3 (F25). The FM antennas are created from the semi-circular heating zone that follows the rear wiper. The medium wave antenna consists of the wing layout to the left in the direction of travel. Other services such as FBD are accommodated in the right wing.

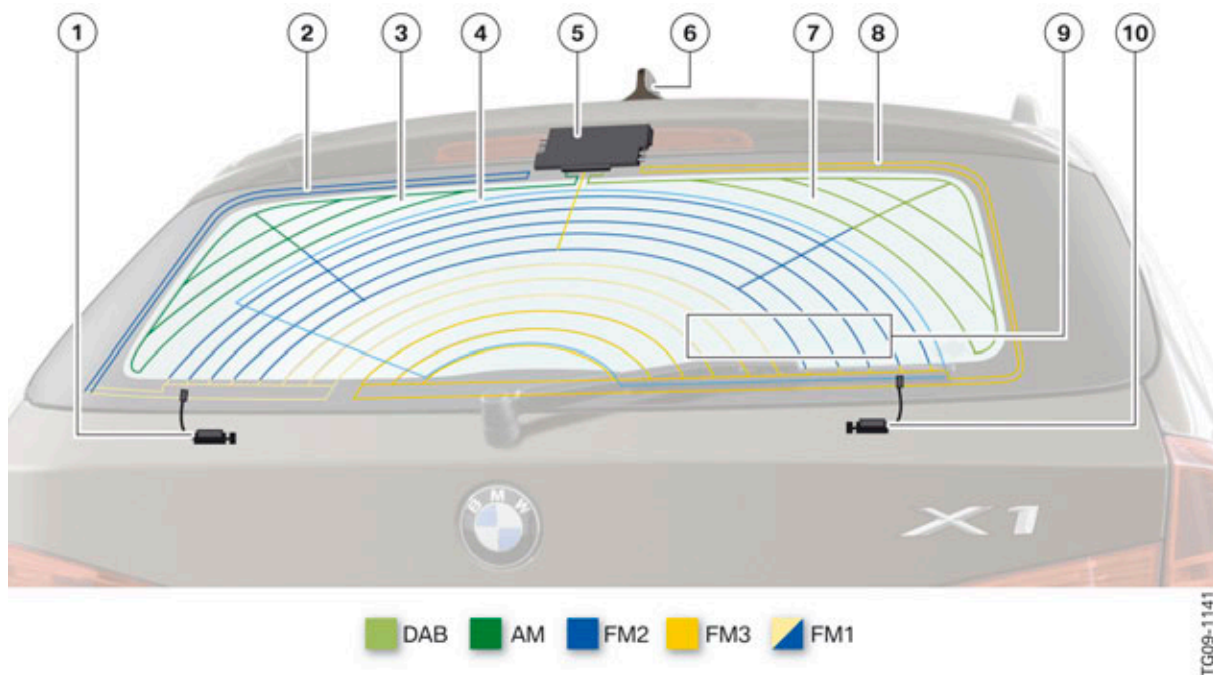
Due to the completely new arrangement into semi-circular heating conductors and the right and left "WINGS," an adequately large area can be gained for the critical medium wave antenna. This layout can also ensure a good defrosting and view out the rear window even for small rear windows as in the BMW X1. At the same time, this arrangement produces a powerful medium wave antenna.

The antenna amplifier is centrally located, whereby additional filters are installed for the integration of the medium wave antenna in the wing layout.



# E84 Complete Vehicle

## 5. General Vehicle Electronics



Antenna window system "WING"

Index	Explanation
1	Heating field connection
2	FM antenna
3	AM antenna field
4	Heating field
5	Antenna Diversity Module AM/FM/FBD
6	Antenna telephone, GPS
7	DAB-III-Band antenna field (Not for US)
8	FM2 antenna field
9	FM1, FBD antenna field
10	Heating field connection

### Speaker and amplifier

The speakers and amplifiers in the BMW X1 are identical to those in the BMW 1 Series. An electro-dynamic planar speaker is used additionally as a central speaker in the instrument panel of the BMW X1, which is installed in the roofliner as in the BMW 3 Series Sport Wagon.

The two bass speakers are positioned under the front seats, thus allowing an even bass sound in the entire vehicle. The required housing volume is achieved as in the BMW 1 Series by connecting the bass speakers to the side sills.

# E84 Complete Vehicle

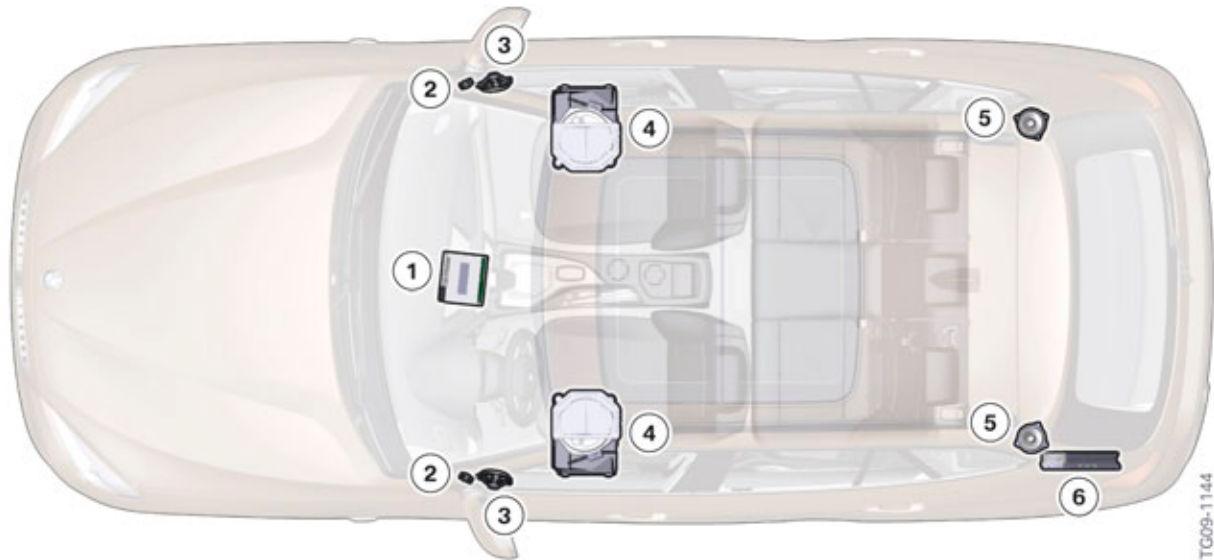
## 5. General Vehicle Electronics

### Audio systems

The following three audio systems are offered:

#### HiFi Sound System

Eight speakers are used in the HiFi sound system. The two bass speakers that are considerably more powerful compared to a basic stereo system are the core element here. The goal of the HiFi sound system is to evenly distribute the sound to all seats. In the front doors, tweeters are added to the system. As a result, the tweeter range output is greatly improved. Due to the external HiFi amplifier, the bass speakers can be activated independently of the front mid-range speakers through two 40 W output stages. The activation and increased number of available filters allow significantly more linear equalizing than is possible with this system.



BMW X1 with HiFi sound system

Index	Explanation
1	Headunit – Radio 2, CIC Professional
2	Left/right front tweeter in the mirror triangle
3	Left/right front mid-range speakers in the door trim panel
4	Bass speaker underneath the left/right front seat
5	Left/right rear tweeters/mid-range speakers in the luggage compartment shoulder
6	Left rear HiFi amplifier in the luggage compartment

#### HiFi Sound System Professional Logic 7

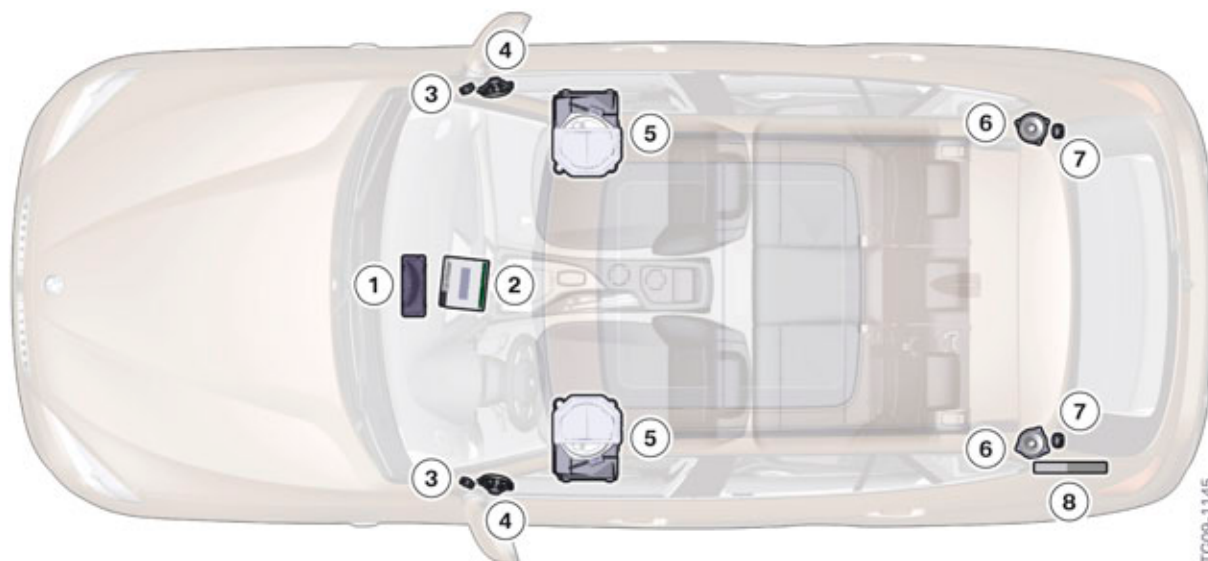
The Harman Kardon HiFi System Professional Logic 7 (SA 688) is further optimized compared to the standard system. The (11 speaker) HiFi system allows the output of surround information included in the stereo signal in 5.2 format while using surround algorithm Logic 7. With the planar speaker (cen-



# E84 Complete Vehicle

## 5. General Vehicle Electronics

ter speaker), the sound pattern can thus be centered in the middle of the instrument panel. The experience is like sitting directly in front of an orchestra. The mid-range speakers and tweeters with aluminium membranes that were further improved compared to the HiFi system provide a significantly more differentiated sound pattern. The influence of driving noise is compensated by speed-dependent equalizing in small stages in the low-frequency range.



BMW X1 with HiFi System Professional Logic 7

Index	Explanation
1	Planar speaker centrally located in the instrument panel
2	Headunit – Radio 2, CIC Professional
3	Left/right front tweeter in the mirror triangle
4	Left/right front mid-range speakers in the door trim panel
5	Bass speaker underneath the left/right front seat
6	Left/right rear mid-range speakers in the luggage compartment shoulder
7	Left/right rear tweeters in the luggage compartment shoulder
8	Top left rear HiFi amplifier in the luggage compartment



**Note :** The Harman Kardon HiFi System Professional Logic 7 (SA 688) is available as an option.

### External connections

The USB connection for data output as well as the AUX socket are located in the center console, directly next to the storage compartment.

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## 5. General Vehicle Electronics



USB connection, data output

Index	Explanation
1	AUX IN connection
2	USB connection

The USB connection for data import is located on the left in the glove compartment, directly next to the glove compartment door lock.



USB connection, data import

### DVD changer

The DVD changer is integrated vertically into the left rear of the luggage compartment in the wheel arch recess.

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## 6. Service Instructions

### 6.1. Condition Based Service (CBS)

The BMW maintenance system Condition Based Service (CBS) also ensures traffic and operational safety of the vehicle in the BMW X1.

A detailed description of the system and the operation with the controller is available in the documentation for the BMW 1 Series and BMW 3 Series as well as in the Owner's Manual for the BMW X1 vehicle.

### 6.2. Diagnosis and program access

The OBD II diagnostic socket in the BMW X1 is located on the driver's side, directly below the vehicle's A-pillar.



Diagnostic socket





Bayerische Motorenwerke Aktiengesellschaft  
Händlerqualifizierung und Training  
Röntgenstraße 7  
85716 Unterschleißheim, Germany